Variable Justice: Environmental Standards, Contaminated Fish, and "Acceptable" Risk to Native Peoples

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I. INTRODUCTION

Fish, especially salmon, are necessary for the survival of the Native peoples of the Pacific Northwest, both as individuals and as a people. Fish are crucial for Native peoples' sustenance, in the sense of a way to feed oneself and one's family. Fish are also crucial for subsistence, in the sense of a culture or way of life with economic, spiritual, social, and physical dimensions—a way to *be* Yakama, or to *be* Tulalip.[1] Salmon, especially, are central to the

1. The term "subsistence" appears to be used differently by various speakers, and so warrants definition. In the context of Alaskan Native practices, David S. Case distinguishes between two senses of the term "subsistence" in a way that may be useful here. He describes the first as rooted in Anglo-European usage, the second as reflective of Native experience. The Anglo-European meaning of subsistence "connotes the bare eking out of an existence, a marginal and generally miserable way of life;" it implicates necessity in a purely physical sense and presumes an economics of scarcity. *See* David S. Case, *Subsistence and Self-Determination: Can Alaska Natives Have a More "Effective Voice"?*, 60 U. Colo. L. Rev. 1009, 1009-12 (1989); *see also* DAVID S. CASE, ALASKA NATIVES AND AMERICAN LAWS 275 (1984). Case suggests the term "sustenance" as a more precise description of this activity. *See id.* at 275. By contrast, a Native understanding of subsistence is larger: "For Natives engaged in subsistence uses, the very acts of hunting, fishing, and gathering, coupled with the seasonal cycle of these activities and the sharing and celebrations which accompany them are intri-

belief systems, identities, and social relationships that define these peoples. The Columbia River Inter-Tribal Fish Commission ("CRITFC"), formed by the Umatilla, Nez Perce, Yakama, and Warm Springs tribes, explains:

> Salmon are part of our spiritual and cultural identity. Over a dozen longhouses and churches on the reservations and in ceded areas rely on salmon for their religious services. The annual salmon return and its celebration by our peoples assures the renewal and continuation of human and all other life. Historically, we were wealthy peoples because of a flourishing trade economy based on salmon . . . . Salmon and the rivers they use are part of our sense of place. The Creator put us here where the salmon return. We are obliged to remain and to protect this place . . . . As our primary food source for thousands of years, salmon continue to be an essential aspect of our nutritional health. Because our tribal populations are growing (returning to pre-1855 levels), the needs for salmon are more important than ever. The annual return of the salmon allows the transfer of traditional values from generation to generation. Without salmon returning to our rivers and streams, we would cease to be Indian people.[2]

The importance of fish, especially salmon, to the first peoples

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cately woven into the fabric of their social, psychological and religious life." *Id.* at 276. Native Americans of the Columbia River Basin express similar understandings. The Columbia River Inter-Tribal Fish Commission, in comments to the U.S. Environmental Protection Agency, describes its member tribes as "ceremonial and subsistence fishers." COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, COMMENTS TO ADMINISTRATOR BROWNER ON THE DRAFT REVISIONS TO THE METHODOLOGY FOR DERIVING AMBIENT WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH 2 (1999) [hereinafter CRITFC Comments]. Margaret Palmer, Yakama Tribal Fisher, explains: "Fishing to me and my family is a way of life, more than a livelihood. It was something that was handed down to us and preserved by our elders." Videotape: My Strength Is From the Fish (Columbia River Inter-Tribal Fish Commission 1994) (on file with author) [hereinafter My Strength Is From the Fish]. According to Don Sampson, now Executive Director of CRITFC:

> The reason I've been fishing is more for my own subsistence, to bring fish home. But maybe more importantly now these days is to maintain that tradition of fishing–of going up to the mountains where my father, my elders fished before me. So it's something that we've got to carry on–that's really why I fish. We've got to pass it on to our children. We have to have that for them in order to be Indians–in order to survive and carry on the things that were placed here for us–and carry on what our elders tell us and teach us.

Id. The EPA, on the other hand, sometimes uses the term "subsistence" in this sense, or denotes as "subsistence fishers" those subpopulations whose understanding of the place of fish and fishing in their lives echoes that articulated by Palmer and Sampson; but the EPA sometimes uses the term quite loosely, or uses it in an ambiguous manner. *See infra* notes 189-94 and accompanying text. Except when discussing EPA's usage, in this paper I use "subsistence" in line with Case's second sense, the sense also articulated by Palmer and Sampson.

2. Columbia River Inter-Tribal Fish Comm'n, *The Importance of Salmon to the Tribes* (visited Sept. 14, 1998) <http://www.critfc.org.text/IMPORT.HTM>.

of the Pacific Northwest is reflected in myth, in language, in treaties negotiated with invading peoples, in past and present fisheries management practices, in contemporary restoration efforts, and in the ongoing legal and political struggle for the survival of the salmon and the way of life that is bound up with fish and salmon.[3]

Under treaties between these first nations and the United States, the first nations relinquished millions of acres of their original homelands in exchange for assurances that their rights to smaller, retained homelands and their rights to fish on the vast ceded lands would be respected in perpetuity as vital to the flourishing of their identity, culture, religious traditions, and tribal economy.[4] Thus the United States, from at least the time of these treaties, has been cognizant of the importance of fish to these peoples. Indeed, it has urged agreements that enshrine this importance and envision tribal economies dependent on fish and fishing. The United States is, by virtue of the treaties, the guarantor of the tribes' right to fish against federal and state interference, a right reiterated by the federal courts in modern times.[5]

The rivers, streams, estuaries, and other waters that support the treaty-protected fish are now gravely threatened by, among other things, chemical contamination. Chemical agents toxic to humans and to other living things have been emitted, discharged, and leaked into the air, water, soil, and sediments—largely in the course of the majority society's pursuit of industrial and agricultural progress. Once in the environment, these chemical agents behave in various ways: some move, some linger, some biodegrade, some bioaccumulate. Eventually, they, or their chemical successors, may come in contact with the fish that live in contaminated waters. These fish bioaccumulate[6] many of the chemicals present in the ambient water and sediments. Humans that eat these contaminated fish are exposed to the toxins concentrated in the fish tissue. So, even where the treaty-guaranteed fish resource is still available, Native people are left to catch and consume contaminated fish.

Health and environmental agencies at the state and federal

3. *See infra* notes 133-138 and accompanying text.

4. *See, e.g.*, Treaty with the Nisquallys (Medicine Creek Treaty), December 26, 1854, 10 Stat. 1132 (1855); *see also infra* notes 342-43 and accompanying text.

5. *See infra* notes 337-361 and accompanying text.

6. Bioaccumulation is the process by which chemical agents that are persistent and lipophilic become increasingly concentrated in aquatic organisms higher up the food chain.

levels[7] have in the last few decades come to recognize that human health is threatened by consumption of chemically contaminated fish. They have fashioned responses to this conventional understanding of the problem, guided by a handful of federal and state environmental statutes that direct them to set environmental standards "protective of human health." These agencies now consider ingestion of contaminated fish to be the greatest route of human exposure to several chemical agents.[8] They are concerned that exposure to these chemical agents damages human health by various means: some are carcinogens, some are reproductive toxins, some are endocrine disrupters, some have multiple harmful effects. On this understanding of the problem, health and environmental agencies have sought either to reduce the amount of fish humans consume or to reduce the amount of contamination in the fish—so that the risk of negative human health effects is minimized, if not eliminated. In either case, the problem is framed as harm to individual humans' physical health.[9]

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7. Note that tribes, a "third kind of sovereign in our federal system," may in some instances function as "agencies" in carrying out federal environmental statutes. For example, it is well-recognized, at least, that tribes have jurisdiction to issue water quality standards, and to otherwise regulate water pollution and manage water resources on reservation land. Indeed, the Clean Water Act allows tribes to be treated "as States" for purposes of exercising regulatory authority over waters within tribal jurisdiction. *See* 33 U.S.C. § 1377 (1999); *see also* William C. Galloway, Note & Comment, *Tribal Water Quality Standards Under the Clean Water Act: Protecting Traditional Cultural Uses*, 70 WASH. L. REV. 177 (1995). While I recognize that tribes may function as "agencies" in this regard, the comments herein respecting "agencies" are directed in the main to federal and state agencies. This choice reflects the fact that tribal interests are greatly affected by federal and state agency decisions implementing the Clean Water Act and other environmental legislation for areas currently interpreted to be within federal and state agency jurisdiction.

8. This is the case, for example, for polychlorinated biphenyls ("PCBs"), classified by the U.S. EPA as a "probable human carcinogen," and recognized as a developmental, reproductive, neurological, and immunological toxin. *See, e.g.*, BRIDGET BARCLAY, HUDSON RIVER ANGLER SURVEY: A REPORT ON THE ADHERENCE TO FISH CONSUMPTION HEALTH ADVISORIES 5 (1993) (noting the adverse health effects of PCBs and explaining that "[w]hile people can be, and are, exposed to PCBs in the air, water and foods in general, consumption of contaminated fish is considered the greatest route of exposure to PCBs"); OFFICE OF SCIENCE AND TECHNOLOGY, U.S. EPA, FEDERAL ASSISTANCE PLAN FOR STATE FISH CONSUMPTION ADVISORIES. Fish consumption is also a major route of exposure for mercury. *See, e.g.*, *EPA: Browner Reports on Fish Advisories*, M2 PRESSWIRE, June 12, 1996, *available in* 1996 WL 10344868; Indigenous Environmental Network, *Mercury Poisoning of Native Americans* (visited Oct. 7, 1999) <http://www.alphacdc.com/ien/mercury.html>. In addition to PCBs and mercury, chlordane, dioxins, DDT, and some 41 other chemicals are of significant concern for and are covered by fish advisories. *See EPA: Browner Reports on Fish Advisories*, *supra*.

9. *See, e.g.*, ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 449 (2d ed. 1998) (explaining the premise of harm-based regulation: "In the absence of identifiable or threatened harm, there is no warrant for regulating conduct

This conventional understanding of the problem, however, fails fully to comprehend the dimensions of the harm to Native Americans of the Puget Sound and Columbia River Basin. It fails to appreciate the cultural dimension of the harm and fails to recognize the integral role of fish, fishing, and fish consumption in the lives of the Pacific Northwest peoples. It separates out and recognizes but a single strand—individual humans' physical health—from an integrated set of harms wrought by chemical contamination.

Moreover, health and environmental agencies' responses have failed fully to appreciate the legal obligations and normative commitments that constrain their work when it affects these Native Peoples. Legal obligations arising from treaties between the United States and the various Pacific Northwest tribes, from the federal trust responsibility, and from Title VI of the Civil Rights Act of 1964 frame agency decision-making here. Normative commitments, too, should guide agencies' responses. Emerging and well-settled norms require agencies to respect cultural integrity, to promote a conception of equality that includes freedom from both exclusionary and cultural discrimination, and to provide just process.

In failing to honor these legal obligations and normative commitments, agencies' current practice raises issues of what has been termed environmental injustice. But the contours of environmental injustice are different for Native Americans than for other affected groups, and so remedying the injustice will require consideration of a different constellation of issues—among other things, recognition of the unique historical and legal aspects of Native Americans' claims. This Article will explore this constellation, focusing on agencies' use of quantitative risk assessment to set environmental standards limiting the contamination in water and sediments that support fish on which Pacific Northwest peoples depend. This Article will discuss the differences between what is understood by agencies to be at stake and what is actually at stake

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under most contemporary theories of social and political organization"). *But cf.* Environmental Protection Agency v. California, 426 U.S. 200, 202-05 (1976) (discussing the shift in Federal Water Pollution Control Act focus from "tolerable effects" of water pollution to "preventable causes"); Principles of Environmental Justice, PROCEEDINGS OF THE FIRST NATIONAL PEOPLE OF COLOR ENVIRONMENTAL LEADERSHIP SUMMIT xiii (1991) (on file with the Stanford Environmental Law Journal) (stating that "[e]nvironmental justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production") [hereinafter Principles of Environmental Justice].

for these Native peoples. The remainder of this Part introduces these differences as they are raised by agencies' current responses to the contamination of the waters and fish on which Native peoples depend.

A. *The Conventional Understanding of the Harmful Effects of Contaminated Fish*

The first agency response to the problem of human exposure to contaminated fish has been to request people to stop eating fish believed to be contaminated. This strategy involves issuing fish advisories warning against the consumption of fish from particular contaminated waters.[10] Yet, fish—if uncontaminated—are an excellent source of dietary protein and other nutrients for humans. Experts in nutrition extol the health benefits of eating fish.[11] Relatively low in fat, fish efficiently meet human requirements for protein and for other nutrients, such as selenium.[12] Fish are also an attractive source of dietary protein because they generally cost less than other animal sources of protein.[13] In fact, if one can dip a net or drop a line into a bay or river nearby, one can bypass the need to purchase fish altogether.[14] Indeed, coastal peoples have for gen-

10. *See, e.g.*, PAMELA SHUBAT, MINNESOTA DEPARTMENT OF HEALTH, HEALTH RISK ASSESSMENT FOR THE CONSUMPTION OF SPORT FISH CONTAMINATED WITH MERCURY, PCBs AND TCDD 1 (1993); Dawn Gagnon, *Spiritual Keepers of the Penobscot*, BANGOR DAILY NEWS, Oct. 6, 1995, *available in* 1995 WL 8770065 ("As recently as this spring, state health officials warned women of childbearing age to avoid eating fish from the Penobscot River below Lincoln, the Kennebec River below Skowhegan, and all of the Androscoggin River due to the presence of dioxin. All others were advised to use caution."). *See generally* 2 U.S. ENVTL. PROTECTION AGENCY, GUIDANCE FOR ASSESSING CHEMICAL CONTAMINANT DATA FOR USE IN FISH ADVISORIES: RISK ASSESSMENT AND FISH CONSUMPTION LIMITS (2d ed. 1997). The EPA reminds that "fish constitute the only class of foods subject to total governmental prohibition in large geographic areas of the United States for substantial time periods because of exposure to potentially hazardous environmental pollutants." OFFICE OF WATER, U.S. ENVTL. PROTECTION AGENCY, CONSUMPTION SURVEYS FOR FISH AND SHELLFISH: A REVIEW AND ANALYSIS OF SURVEY METHODS 35 (1992).

11. *See, e.g.*, Renate D. Kimbrough, *Consumption of Fish: Benefits and Perceived Risk*, 33 J. TOXICOLOGY & ENVTL. HEALTH 82-83 (1991); Yvonne Smith & Laura Berg, *Ancient Tradition Modern Reality: Is There a Future for a Salmon-Based Culture?*, 1 WANA CHINOOK TYMOO 14 (1998).

12. *See, e.g.*, Kimbrough, *supra* note 11, at 82-83; Smith & Berg, *supra* note 11.

13. *See* Kimbrough, *supra* note 11, at 83.

14. Delbert Frank, Sr., of Warm Springs, explains:

> I used to fish at Celilo Falls before The Dalles Dam was built. We used to be able to fish all year long. We caught lots of different kinds of fish–spring chinook, summer chinook, bluebacks, fall chinook, steelhead, and coho. When the fish were coming in good, I could catch one ton of salmon a day. And, it didn't take a lot of fancy gear or expensive boats to fish. For the cost of one or two balls of

erations looked to the water for their sustenance and, for some peoples, for subsistence.[15]

Regulatory agencies are not unaware that the health benefits of fish consumption make this first approach precarious. When fish advisories are effective, humans heed warnings not to consume fish from contaminated waters.[16] But these people become subject to the serious health risks associated with protein, nutritional, and even caloric deficiencies unless they can find substitute dietary sources. For most individuals affected by advisories announced by federal or state agencies, the need to find substitute food sources is unproblematic. There are clear metrics along which substitutions are to be made: grams of protein or kilocalories of energy. And, apart from some losses in efficiency or reorientation of habit or predilection, such substitution provides little reason for pause.

For a few affected individuals, however, an inability to pay for substitute sources leaves few options. No fish may mean no dinner. The first strategy then imposes a double bind: ignore the fish advisories and be exposed to contaminants in amounts deemed unacceptable for humans, or abide by the advisories and forgo a meal. For those affected individuals who rely most heavily on fish for food—American Indians[17] prominent among them—this double bind is especially harsh. Ignoring the fish advisories may mean ex-

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twine, about 6 to 12 dollars, I could make the fishing gear necessary for me to catch enough fish to supply my family and many others for a whole year.

Columbia River Inter-Tribal Fish Comm'n, *Celilo Falls* (visited Oct. 8, 1999) <http://www.critfc.org/text/CELILO.HTM>; *see also,* Patrick C. West, *Health Concerns for Fish-Eating Tribes?*, EPA J., Mar.-Apr. 1992, at 15. ("With [the fish] resource so highly valued both culturally and economically by [the Great Lakes] tribes, we would expect to find high levels of fish consumption–especially on the Bay Mills reservation, where high levels of poverty prevail and subsistence small-skiff fishermen are common. Even for the commercial fishing sector of the economy, it has been well established that much extra fish is distributed among crew members for subsistence consumption (as part of labor compensation) and as part of cultural ritual and tradition.").

15. *See supra* note 1.

16. *See* BARCLAY, *supra* note 8, at 10-11. Note that agency reliance on fish advisories assumes that the advisories reach the affected individuals and that these individuals understand the advisories' import. *See id.* at 10; *see also* GREAT LAKES INDIAN FISH & WILDLIFE COMMISSION, 1993 GLIFWC SURVEY OF TRIBAL SPEARERS: MERCURY CONCERNS at 1 (noting that "only about half [of respondents in our study] were aware of or had looked at a State Health Advisory for information on mercury levels in fish").

17. This is not to say that all Native Americans rely heavily on fish, or that those who do rely on fish do so to the same extent or for the same reasons. It is neither possible nor appropriate to universalize Native American cultures, histories, or beliefs. *See generally* ROBERT F. BERKHOFER, JR., THE WHITE MAN'S INDIAN: IMAGES OF THE AMERICAN INDIAN FROM COLUMBUS TO THE PRESENT (1978). This article focuses mainly on Native Americans of the Pacific Northwest. *See* discussion *infra* note 27 and accompanying text. Even among the

posure to far greater amounts of contaminants than human systems are believed able to tolerate, while heeding the advisories may mean forgoing not only tonight's meal, but also tomorrow morning's meal, and the midday meal after that. The limitations of even "effective" fish advisory programs are thus clear to agencies concerned with protecting human health.

Recognizing the limitations of the first strategy, agencies use a variety of regulatory measures in an attempt to minimize human exposure to toxins contained in the fish. Under this second strategy, agencies impose water quality[18] or cleanup[19] requirements that permit only certain "acceptable" amounts of contamination to remain in the environment in which fish live, thereby reducing the quantity of contaminants concentrated in the fish people eat. When this second strategy is considered effective, environmental standards are set at levels protective of fish-consuming humans. Thus, the contaminating agents are no longer permitted to be discharged in quantities that would result in dangerous levels of exposure to humans, and those agents already present in the surface water and sediments are cleaned up to levels safe for humans. When the second strategy is effective, humans can continue to eat fish as they had, catching them from their usual bays, lakes or rivers, in the usual quantities and kinds.

However, if not properly undertaken, this second regulatory strategy may produce the same double bind as the first. When agencies use quantitative risk assessment ("QRA") to set health-based environmental standards, they often rely on standard assumptions about inputs to the risk assessment equation. For exam-

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peoples of the Pacific Northwest, there are differences. Nonetheless, the issues raised here may be applicable to other Native Americans.

18. *See, e.g.*, Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. § 1251(a)(3), 1313(d) (1994) (requiring agencies to establish residual health-based standards, in the form of total maximum daily loads ("TMDLs") for those bodies of water that fail to meet water quality standards by the application of technology-based effluent limitations). For a thorough discussion of the evolving role of health-based standards in the Clean Water Act's regulatory scheme for toxic pollutants, see Oliver A. Houck, *The Regulation of Toxic Pollutants Under the Clean Water Act*, 21 ENVTL. L. REP. (Envtl. L. Inst.) 10528 (1991); Oliver A. Houck, *TMDLs, Are We There Yet?: The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REP. (Evntl. L. Inst.) 103391 (1997); Oliver A. Houck, *TMDLs III: A New Framework for the Clean Water Act's Ambient Standards Program*, 28 ENVTL. L REP. (Envtl. L. Inst.) 10415 (1998); Oliver A. Houck, *TMDLs IV: The Final Frontier*, 29 ENVTL. L. REP. (Envtl. L. Inst.) 10469 (1999).

19. *See, e.g.*, Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601-75 (1994 & Supp. 1997); Model Toxics Control Act, WASH. REV. CODE § 70.105D (1999).

ple, in setting standards for water that support fish that humans then consume, agencies typically assume an "average American's"[20] fish consumption practices. However, humans consume fish in varying quantities, depending on socio-demographic and cultural differences.[21] Native Americans of the Pacific Northwest, for example, consume vastly greater quantities of fish than non-Native Americans. So do Native Americans of the Great Lakes,[22] of the Mattaponi and Pamunkey Rivers,[23] and of the Penobscot River Basin.[24] In fact, the "average American" tends to consume far less fish than Native Americans from coastal regions. By failing to take into account the amount and kind of fish consumed by these Native peoples, and thus their exposure to the toxic contaminants in fish, the resulting environmental standards will underestimate their risk. This second strategy thus may present the same double bind as the first: continue to consume the same amount and kind of fish and risk compromised individual health, or reduce fish consumption to look like that of the "average American" and risk nutritional and caloric deficiency.[25] However, this is but a partial picture of the double bind for these Native Americans.

Given even this partial picture of what is at stake, current agency practice is deeply troubling as a matter of distributive justice. It countenances far greater health risks to some groups of individuals than to others, and requires that Native Americans,

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20. *See generally*, AMERICANIZING THE AMERICAN INDIAN (Francis Paul Prucha, ed. 1973).

21. *See, e.g.*, Patrick C. West, *Invitation to Poison? Detroit Minorities and Toxic Fish Consumption from the Detroit River*, *in* RACE AND THE INCIDENCE OF ENVIRONMENTAL HAZARDS: A TIME FOR DISCOURSE 96 (Bunyan Bryant & Paul Mohai eds., 1992) (recounting evidence of higher consumption for non-Whites than for Whites of fish caught in Detroit River) [hereinafter RACE AND THE INCIDENCE OF ENVIRONMENTAL HAZARDS]; Patrick C. West et al., *Minority Anglers and Toxic Fish Consumption: Evidence from a Statewide Survey of Michigan*, *in* RACE AND THE INCIDENCE OF ENVIRONMENTAL HAZARDS, *supra*, at 100 [hereinafter West, *Minority Anglers*]; *see also infra* notes 154-78 and accompanying text.

22. *See, e.g.*, GREAT LAKES INDIAN FISH & WILDLIFE COMMISSION, *supra* note 16, at app. 2 at 2, 4; Patrick C. West, *Health Concerns for Fish-Eating Tribes?*, 18 E.P.A. J. 15 (Mar.-Apr. 1992) [hereinafter West, *Health Concerns*].

23. *See* Brief for Appellant at 24, National Resources Defense Council v. EPA, 16 F.3d 1395 (4th Cir. 1993) (No. 92-2520).

24. *See* ENVIRONMENTAL DEFENSE FUND ET AL., THE PROTECTION OF SPORT AND SUBSISTENCE FISHING POPULATIONS IN THE UNITED STATES 5, 7-9 (1994).

25. For a criticism of the use of law as a tool of colonization by the dominant society and for the point that a truly "American" jurisprudence would accept and respect Indian values rather than require Indians to craft their claims in accordance with the white man's legal and political values, see Robert A. Williams, Jr., *The Algebra of Federal Indian Law: The Hard Trial of Decolonizing and Americanizing the White Man's Indian Jurisprudence*, 1986 WIS. L. REV. 219.

among others, disproportionately shoulder the environmental harms that have attended industrial and agricultural "progress." However, the economic and other benefits of this progress have often been enjoyed not by the Native Americans and others who are most heavily burdened by the resultant health risk, but instead overwhelmingly by affluent, Anglo-European Americans. This maldistribution of environmental benefits and burdens is one hallmark of what has come to be called environmental injustice.[26]

B. *The Cultural Dimensions of the Harm to Pacific Northwest Native Peoples*

For the Tulalip, the Squaxin Island, and other peoples of the Puget Sound, the Straits of Juan de Fuca, and the Pacific Coast of what is now Washington State,[27] and for the Umatilla, Nez Perce,

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26. Given evidence that environmental risks are borne disproportionately by Native Americans, other people of color, and people in low-income communities, environmental justice advocates begin by making a basic distributive claim: no single group or community should be required to shoulder societal environmental burdens. *See, e.g.*, Michael Fisher, *Environmental Racism Claims Brought Under Title VI of the Civil Rights Act*, 25 ENVTL. L. 285, 296-303 (1995); *see also* Robert R. Kuehn, *The Environmental Justice Implications of Quantitative Risk Assessment*, 1996 U. ILL. L. REV. 103, 140; CRITFC Comments, *supra* note 1, at 6. Although distributive justice is one facet of environmental justice, advocates point out that achieving equal distribution of environmental harms is not coextensive with achieving environmental justice. *See* Sheila Foster, *Justice from the Ground Up: Distributive Inequities, Grassroots Resistance, and the Transformative Politics of the Environmental Justice Movement*, 86 CAL. L. REV. 775, 788-807 (1998). Reverend Benjamin F. Chavis, Jr., explains:

> Environmental justice advocates are not saying, 'Take the poisons out of our community and put them in a white community.' They are saying that no community should have to live with these poisons. They have thus taken the moral high road and are building a multiracial and inclusive movement that has the potential of transforming the political landscape of this nation.

BENJAMIN F. CHAVIS, JR., CONFRONTING ENVIRONMENTAL RACISM: VOICES FROM THE GRASSROOTS 5 (Robert D. Bullard ed., 1993). *But cf.* Dean B. Suagee, *Turtle's War Party: An Indian Allegory on Environmental Justice*, 9 J. ENVTL. L. & LITIG. 461, 471 & n.11 (1994) (pointing out "one of the key differences between Indian tribes and other 'communities of color' whose interests are championed under the banner of Environmental Justice[:] Indian tribes are sovereign governments" and cautioning that characterizing Indian tribes as minorities has often worked to the detriment of tribes). *See infra* notes 32-35 and accompanying text.

27. References in this paper to "peoples of the Pacific Northwest" or "Native Americans of the Pacific Northwest" are meant to include, to the extent that the analysis is relevant to their experiences and practices, peoples of the Puget Sound, the Straits of Juan de Fuca, and the Pacific Coast of what is now Washington state, as well as the peoples of the Columbia River Basin. The Tulalip and Squaxin Island are mentioned in particular because one recent effort to gather data regarding fish consumption practices of Native Americans in this region focused on the Tulalip and the Squaxin Island, who were selected non-randomly from among what the authors referred to as "the fourteen Puget Sound tribes . . . to represent the expected range of fishing and fish consumption activities of tribes in the region." KELLY A. TOY ET AL., A FISH CONSUMPTION SURVEY OF THE TULALIP

Yakama, and Warm Springs peoples of the Columbia Basin, the harm stemming from current agency policy goes beyond the maldistribution of harm to individuals' health. When agency strategies require these peoples *either* to ingest toxic contaminants in amounts determined to be poisonous to humans *or* to adjust their fish consumption practices to look like those of the "average American," the strategies pose an additional threat: injury to a culture that is bound up with the fish. It is in an important sense beyond the scope and ability of this Article to say what it is that is threatened, but it is nonetheless vital to explore this facet of the harm.

Agencies' tasks are different where Native Americans are affected, because unlike for most other individuals who consume fish, finding replacements for fish is not simply a matter of finding substitute food sources that satisfy palate and pocketbook.[28] There are no ready and unproblematic metrics by which a Yakama can assess replacements for fish in his life, as there are for most non-Indians. The first peoples of the Pacific Northwest are fishing peoples. Fish and fishing are necessary not only to maintain the physical health of individuals, but also to maintain the cultural health

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AND SQUAXIN ISLAND TRIBES OF THE PUGET SOUND REGION 2 (1996). The authors expressly caution, however, that "[w]hile data from these tribes may be representative of consumption rates of other tribes, it should be understood that fish consumption rates, habits, and patterns can vary among tribes and other subpopulations." *Id.* at 1. Note that seventeen tribes in addition to the Tulalip and Squaxin Island have formed the Northwest Indian Fisheries Commission in recognition of their similar experiences and interests in this respect: Jamestown S'Klallam, Lower Elwha Klallam, Port Gamble S'Klallam, Lummi, Makah, Muckleshoot, Nisqually, Nooksack, Puyallup, Quileute, Quinault, Sauk-Suiattle, Skokomish, Stillaguamish, Suquamish, Swinomish, and Upper Skagit.

28. This is not to downplay the economic aspects of the issues at hand. Fish are now, and have always been, vital to the economy of Native Americans of this region. Fish are caught for consumption by fishers, their families and friends; for distribution to other tribal members; and for commercial distribution. Moreover, economic development and self-sufficiency are pressing concerns for many tribes, given the poverty experienced by their members. *See generally* WHAT CAN TRIBES DO? STRATEGIES AND INSTITUTIONS IN AMERICAN INDIAN ECONOMIC DEVELOPMENT (Stephen Cornell & Joseph P. Kalt eds., 1993); James L. Huffman, *An Exploratory Essay on Native Americans and Environmentalism*, 63 U. COLO. L. REV. 901, 914-20 (1992) (criticizing mainstream environmentalist policies that would have Indian economic development limited to only those activities consonant with environmentalists' ideas of what living "in harmony with nature" would require, with the result that Indians' often desparate conditions of poverty would be made worse, rather than better); Rebecca Tsosie, *Tribal Environmental Policy in an Era of Self-Determination: The Role of Ethics, Economics, and Traditional Ecological Knowledge*, 21 VT. L. REV. 225, 320-29 (1996) (discussing insights from alternative models for tribal economic development and noting the connection between territorial autonomy and self-determination on the one hand, and economic self-sufficiency on the other).

and integrity of the group. As Don Sampson, now Executive Director of CRITFC, explains, fishing is "something that we've got to carry on . . . . We've got to pass it on to our children. We have to have it for them in order to be Indians—and carry on what our elders tell us and teach us."[29] When agency strategies present the "choice" outlined above, the depth and dimensions of the double bind must be understood to include the threat to culture as well. Indeed, this "choice" echoes ominously the "choices" presented to Native Americans under now-disclaimed policies of the federal government: survival is implicitly or explicitly conditioned upon assimilation into the dominant culture, and upon a renunciation of Native Americans' ways of living.[30]

Such threats to the survival of first peoples have come to be recognized by some as another facet of environmental injustice.[31] To the extent that agencies have registered these concerns, they may nonetheless fail fully to appreciate the contours of environmental injustice for Native peoples. For Native Americans in the United States, issues of environmental justice implicate issues of religious freedom, sovereignty, political self-determination, economic development, treaty observance, federal trust obligations, human rights, and property rights.[32] Environmental justice for Native Americans thus encompasses a different constellation of issues than it does for other affected groups.[33] It requires, among other things, acknowledging the unique historical and legal aspects of natives' claims.[34]

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29. My Strength Is From the Fish, *supra* note 1.

30. *See generally* Williams, *supra* note 25; DAVID H. GETCHES ET AL., CASES AND MATERIALS ON FEDERAL INDIAN LAW 41-72 (4th ed. 1998).

31. In addition to claims advanced by other environmental justice advocates, indigenous rights advocates highlight important connections between Native sovereignty, political, cultural and economic self-determination, and environmental justice. *See* Tom B. K. Goldtooth, *Indigenous Nations: Summary of Sovereignty and Its Implications for Environmental Protection*, *in* ENVIRONMENTAL JUSTICE: ISSUES, POLICIES, AND SOLUTIONS 138 (Bunyan Bryant ed., 1995); Winona LaDuke, *We Are Still Here: The 500 Years Celebration*, RACE, POVERTY & THE ENV'T, Fall 1992, at 20-21; Principles of Environmental Justice, *supra* note 9 ("Environmental justice affirms the fundamental right to political, economic, cultural and environmental self-determination for all peoples."); Robert A. Williams, Jr., *Large Binocular Telescopes, Red Squirrel Piñatas, and Apache Sacred Mountains: Decolonizing Environmental Law in a Multicultural World*, 96 W. VA. L. REV. 1133 (1994).

32. *See* Goldtooth, *supra* note 31; LaDuke, *supra* note 31; Principles of Environmental Justice, *supra* note 9; Williams, *supra* note 31.

33. *See* Suagee, *supra* note 26.

34. *See* Goldtooth, *supra* note 31, at 139; Principles of Environmental Justice, *supra* note 9 ("Environmental justice must recognize a special legal and natural relationship of

C. *Quantitative Risk Assessment and Environmental Justice*

This Article explores this constellation of issues in the context of agencies' use of quantitative risk assessment ("QRA") to set environmental standards for the water and sediments that support fish on which Pacific Northwest peoples depend. It focuses on the example of QRA because this decisional tool is highly malleable, and agencies are required to make subjective judgments at numerous junctures in the risk assessment process. As such, QRA presents particularly worrisome opportunities for assumptions and judgments that discriminate against, are indifferent toward, or misunderstand Native Americans' different fish consumption practices. Even well-intentioned agency risk assessors may have failed to appreciate the role of fish, fishing and fish consumption in the lives of the peoples of the Pacific Northwest. In fact, by relying on standard assumptions about the "average American," agencies have grossly underestimated the exposure of these peoples, with the consequence that the resulting environmental standards fail adequately to protect these people.

Efforts to challenge these standards in court have been to little avail. In two recent decisions involving water quality standards for dioxin, *Dioxin/Organochlorine Center v. Clarke*[35] and *Natural Resource Defense Council v. EPA*,[36] the courts upheld EPA's use of a standard assumption for the fish consumption rate ("FCR") it factored into the risk assessment equation. This standard assumption—that humans eat 6.5 grams of fish per day (roughly one fish meal per month)—is intended to estimate consumption by the "average American."[37] But, as available evidence indicated, this figure significantly underestimates consumption by the affected Native peoples who eat one or more fish meals *per day*. Although the EPA has recently moved to revisit its 1980 water quality criteria[38]—the source of the 6.5 grams/day standard assumption—months and years pass in the meantime in which environmental standards are

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Native People to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination."); Suagee, *supra* note 26.

35. 57 F.3d 1517 (9th Cir. 1995).

36. 16 F.3d 1395 (4th Cir. 1993).

37. Guidelines and Methodology Used in the Preparation of Health Effect Assessment Chapters of the Consent Decree Water Criteria Documents, 45 Fed. Reg. 79,347, App. C (1980).

38. Draft Water Quality Criteria Methodology Revisions: Human Health, 63 Fed. Reg. 43,756 (1998) [hereinafter Draft AWQC Revisions].

set by agencies and approved by courts, and the standards remain insufficiently protective of highly-exposed Native subpopulations.

Health and environmental agencies have also failed fully to appreciate that their decisions affecting Native American subpopulations must be framed by legal obligations arising from treaties between the United States and the Pacific Northwest tribes, the federal trust responsibility, and Title VI of the Civil Rights Act of 1964. Agencies have also proceeded with apparent indifference to the values of cultural integrity, a conception of equality that includes protection from both exclusionary and cultural discrimination, and a just decision-making process. Agencies have instead made decisions according to standard analytical methods that seek a "balance" between the costs of environmental protection and the benefits of risk-producing activities. Such methods might be appropriate if the identities of the most exposed were unknown and unknowable, if the risks were distributed equitably, and if the stakes were the same for everyone affected. But such methods are inappropriate where these conditions do not obtain. They are objectionable here because the risks are disproportionately imposed on some identifiable Native American subpopulations and the stakes for these subpopulations are different than for the general population: not only individual humans' health, but cultural survival is at issue. In view of the relevant legal obligations and normative commitments, tradeoffs that may be permissible as a general matter become impermissible when the highly-exposed subpopulations are Native Americans.

Accordingly, this Article has several aims. The first aim is to urge changes to agency standard-setting practice to account for the higher fish consumption rates of Native Americans of the Pacific Northwest. Because the hope here is to stem the immediate injuries to those affected by the resulting standards, this is the most urgent task for this Article. A subsidiary aim is to question the hegemony of quantitative risk assessment and its associated epistemology. In my view, agencies' attachment to this epistemology explains some part of their failure to produce standards sufficiently protective of all fish-consuming humans. Finally, I mean to contribute to the understanding that for some Native peoples, the threat here is at once to individual health and to cultural survival; this threat is occasioned not only by the standards that emerge from agencies' standard-setting process, but by the process itself.

Part II of this Article briefly outlines the quantitative risk assess-

ment process and, after a caveat about agencies' choice of the tool at all, explains how this process is used by health and environmental agencies to evaluate risk and to set environmental standards to protect against risk. Part II also explains and distinguishes uncertainty and variability, important concepts for understanding QRA in practice.

Part III begins by offering accounts of the importance of fish to the Pacific Northwest peoples. It explains how risk is estimated for human exposure to carcinogens via the fish ingestion pathway. It presents evidence of cultural and socio-demographic sources of variation in fish consumption rates, noting in particular that Native Americans of the Pacific Northwest consume fish at considerably greater rates than do members of the general population.

Part IV examines current practice in the agencies and courts. First, it discusses agencies' proffered justifications for providing a higher level of protection to non-Indian populations, and "lower yet adequate" protection to Native American subpopulations. Second, it describes the EPA's Draft AWQC Revisions. Finally, it scrutinizes agency responses to instances of uncertainty and variability in the risk assessment process, and argues that there has been some confusion between the two.

Part V returns to the fish consumption evidence and criticizes current risk assessment practice. Given the variability and indentifiability of fish consumption rates explored in previous Parts, it argues that differential treatment of the particular highly-exposed subgroups here, i.e., some Native Americans, is warranted on two bases. First, it is necessitated by the mere fact that such highly-exposed subgroups exist, or have emerged from the data, in a context where the stakes are high. Second, it is also necessitated by the identity of the subgroups that are here highly exposed. Native Americans present a particular case, from both a normative and doctrinal standpoint. Relevant normative commitments include respect for cultural integrity, equality, and just process; applicable legal obligations include treaties, the federal trust responsibility, and Title VI of the Civil Rights Act of 1964. Finally, Part VI offers specific recommendations for consideration by agencies and tribes as they engage in the process of environmental standard-setting.

II. Risk Assessment

Quantitative risk assessment has enjoyed a spectacular ascendancy in recent years. Although it has been around as a decisional

tool since the 1970s, it is increasingly being employed by health and environmental agencies to set health-based environmental standards.[39] And, it is increasingly being employed not only by federal agencies, but also by state and local agencies.[40] President Clinton's recent Executive Order on Regulatory Planning and Review[41] and a steady stream of congressional bills[42] look to guarantee the role of QRA in agency decision making. Indeed, congressional and other proposals have called for greater reliance on quantitative risk assessment, sometimes encouraging layered use of quantitative analysis *about* quantitative analysis.[43]

Use of QRA is somewhat controversial. After outlining the risk assessment method and explaining how agencies use it to set health-based environmental standards, this Part sketches three

39. *See* Kuehn, *supra* note 26, at 103-05, 108-12; Mark Eliot Shere, *The Myth of Meaningful Environmental Risk Assessment*, 19 HARV. ENVTL. L. REV. 409, 410 (1995) (describing "Risk Assessment" as "all the rage," and as "a cornerstone of current administrative practice"); Curtis C. Travis et al., *Cancer Risk Management: A Review of 132 Federal Regulatory Decisions*, 21 ENVTL. SCI. & TECH. 415, 419 (1987).

40. *See* John D. Graham, *The Risk Not Reduced*, 3 N.Y.U. ENVTL. L.J. 382, 386 (1994). However, state and local agencies with little funding may not have the resources to devote to a rigorous risk assessment, or to review data presented to the agency by those seeking to go ahead with a risk-producing activity.

41. Exec. Order No. 12,866, 3 C.F.R. § 638 (1994), *reprinted in* 5 U.S.C. § 601 (Supp. IV 1998).

42. *See* H.R. 690, 104th Cong. (1995) ("A bill to improve the use of risk assessment and cost-benefit analysis by Federal agencies" would have required each of nine enumerated federal agencies to conduct risk assessment and cost-benefit analysis for all major rules protecting human health and the environment; "major" defined as likely to result in an annual effect on the economy of $25 million or more); S. 229, 104th Cong. (1995) ("A bill to require the Administrator of the Environmental Protection Agency to conduct risk assessments and cost-benefit analysis in promulgating regulations relating to human health and the environment, and for other purposes" would have required EPA, among other things, to certify that its major regulations were the result of risk assessments that had been based on the best obtainable scientific information; "major" defined as having an effect on the economy of $100 million or more in any one year); S. 981, 105th Cong. (1997) ("A bill to provide for analysis of major rules" would require risk assessment for major rules and would establish principles for risk assessments; "major" defined as costing over $100 million or deemed by OMB to have a significant impact on the economy).

43. For example, some urge quantification of uncertainties in a quantitative risk assessment. *See* COMMITTEE ON RISK ASSESSMENT OF HAZARDOUS AIR POLLUTANTS, NAT'L RESEARCH COUNCIL, SCIENCE AND JUDGMENT IN RISK ASSESSMENT 184-85 (1994) [hereinafter SCIENCE AND JUDGMENT]; Graham, *supra* note 40, at 401; Susan R. Poulter, *Monte Carlo Simulation in Environmental Risk Assessment–Science, Policy and Legal Issues*, 9 RISK: HEALTH, SAFETY & ENV'T 7, 7 (1998). *But see* 2 THE PRESIDENTIAL/CONGRESSIONAL COMMISSION ON RISK ASSESSMENT AND RISK MANAGEMENT, RISK ASSESSMENT AND RISK MANAGEMENT IN REGULATORY DECISION-MAKING: FINAL REPORT 88 (1997) ("The Commission recommends against routine use of formal quantitative analysis of uncertainties in risk estimation, particularly that related to evaluating toxicity.").

sources of controversy. First, QRA proceeds according to a particular conception of rational decision-making. Second, QRA in practice is highly malleable. Third, the choice of QRA as a decisional tool may work to the particular disadvantage of risk-bearing communities.

A. *Quantitative Risk Assessment: The Method*

Humans are exposed to environmental contaminants via a variety of pathways: we inhale toxic air contaminants; we drink contaminated ground water; we eat fish that swim in and bioaccumulate toxins from contaminated surface water.[44] Risk in this context is the product of the toxicity of the contaminant and the duration and frequency of human exposure to that contaminant.[45] Risk assessment attempts to measure the magnitude and probability of the harm to human (and, more rarely, ecological) health posed by environmental contaminants.[46] The method of quantitative risk assessment has been described at length elsewhere in legal and policy literature;[47] for present purposes, a brief overview follows.

1. *Basic components of quantitative risk assessment.*

The National Research Council of the National Academy of Sciences has identified four basic components of risk assessment: hazard identification, toxicity or dose-response assessment, exposure assessment, and risk characterization.[48] Hazard identification determines whether exposure to a chemical agent causes increased incidence of adverse health effects in humans and, if so, under what circumstances. This initial step in the process entails identification of contaminants suspected to pose a health hazard, quantification of the concentrations at which they are present in the environment, description of the specific forms of toxicity (is the

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44. *See* Curtis D. Klaasen & John Doull, *Evaluation of Safety: Toxicologic Evaluation, in* TOXICOLOGY: THE BASIC SCIENCE OF POISONS 11, 13-14 (John Doull et al. eds., 2d ed. 1980).

45. *See id.* at 14; U.S. ENVTL. PROTECTION AGENCY, EXPOSURE FACTORS HANDBOOK (Draft 1996).

46. *See* Notice of Availability and Opportunity to Comment on Proposed Guidelines for Carcinogen Risk Assessment, 61 Fed. Reg. 17,960, 17,961-63 (1996).

47. *See* SCIENCE AND JUDGMENT, *supra* note 43; Alon Rosenthal et al., *Legislating Acceptable Cancer Risk from Exposure to Toxic Chemicals*, 19 ECOLOGY L.Q. 269, 277-95 (1992); Symposium, *Risk Assessment in the Federal Government*, 3 N.Y.U. ENVTL. L. J. 251-591 (1995) [hereinafter NYU Symposium on Risk Assessment].

48. *See* Nat'l Research Council, Risk Assessment in the Federal Government: Managing the Process 3 (1983); SCIENCE AND JUDGEMENT, *supra* note 43, at 4, 26-27 (1994).

agent a neurotoxin, a carcinogen, a mutagen?) caused by the agent, and evaluation of the conditions under which these forms of toxicity might be expressed in exposed humans. Dioxin, for example, is a carcinogen, an immunotoxin, a reproductive toxin, a developmental toxin, and an endocrine disrupter.[49]

Toxicity or dose-response assessment provides a quantitative characterization of the relation between the exposure to or dose received of the contaminant and the response in exposed humans, i.e., incidence and severity of the adverse health effect. This step may include discussion of variations in response, for example, differences in susceptibility of young and old people. Dose-response assessment involving extrapolation to low doses employs different assumptions depending on whether the agent's toxic effect is cancer or some other health "endpoint." For noncarcinogens, risk assessors attempt to identify a threshold dose or exposure level below which there are no observed adverse effects.[50] For carcinogens, risk assessors believe that there is "no threshold" for the dose-response relationship or that, "if one does exist, it is very low and cannot be reliably identified."[51]

Exposure assessment addresses the conditions (intensity, frequency, duration) of human exposure to the agent. Exposure assessment tracks a contaminant's progress from emission or discharge, through presence in the air, water, soil, or sediments, to contact with humans. This step entails examining the relationship between environmental concentrations of the agent and various routes or pathways of human exposure (e.g., inhalation, dermal absorption, ingestion).

Risk characterization, the final step in the process, incorporates the results from the three previous steps. At this juncture, the risk assessor derives an estimate of the type and magnitude of the adverse effect to an exposed individual or population, as well as the probability of the effect occurring. For carcinogens, risk is typically expressed as the increased probability that an individual will die from cancer.[52] Although this Article raises concerns relevant to

49. *See, e.g.*, Karen F. Schmidt, *Dioxin's Other Face: Protrait of an "Environmental Hormone"*, 141 SCI. NEWS 24, 25 (1992).

50. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 60-64.

51. *See id.* at 65-66.

52. *See* JOHN J. COHRSSEN & VINCENT T. COVELLO, RISK ANALYSIS 85 (1989). By comparison, for noncarcinogens, risk is expressed by reference to a "hazard quotient," which is derived by dividing the estimated population exposure level by the threshold or reference dose. If this quotient is greater than one, the population's exposure is greater than the

toxins with health endpoints other than cancer, i.e., non-carcinogens, it will focus on the particular concerns of quantitative risk assessment for carcinogens. References to "risk" will be to risk of cancer, unless otherwise noted.

2. *Derivation of health-based and environmental standards.*

As noted above, risk is the product of toxicity and exposure. Health-based environmental standards can be derived by a simple manipulation of the risk equation. Environmental agencies determine the amount of contaminants that may permissibly remain in, for example, surface water so that the resulting risk to exposed individuals does not exceed some predetermined "acceptable" level. In the case of surface water quality standards, assuming some given level of acceptable risk, risk assessors solve for concentration, thereby deriving a number that can be translated into an effluent limit or cleanup level to be attained.

What constitutes "acceptable" risk requires what risk assessors refer to as a "policy"question—to be distinguished from questions of pure "science" or questions of mixed "science-policy."[53] Answering this policy question is not an acontextual enterprise. Risk thought to be acceptable in one context may not be acceptable in another. For example, many people may find acceptable higher levels of risk in occupational contexts than in environmental contexts; this may be so, among other reasons, because the former risks are perceived to be voluntarily undertaken. For carcinogens, risk levels deemed acceptable differ from agency to agency, and sometimes differ within a single agency as it implements differing statutory directives.[54] In the case of environmental exposure to carcinogens, what constitutes acceptable risk is sometimes expressed by a single value. Washington's Model Toxics Control Act,

"safe" reference dose and is therefore considered unacceptable. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 39-40.

53. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 18; *see also* K.S. SHRADER-FRECHETTE, SCIENCE POLICY, ETHICS AND ECONOMIC METHODOLOGY 17-24 (1985).

54. The language of the various statutes that have been interpreted to allow or require quantitative risk assessment is, not surprisingly, the root of much of this difference: Primarily narrative in form, these statutes permit a considerable spectrum of approaches to risk assessment and a range of acceptable risk levels. *See* Rosenthal et al., *supra* note 47, at 269 nn.18-19 and accompanying text; Arlene Yang, *Standards and Uncertainty in Risk Assessment*, 3 N.Y.U. ENVTL. L.J. 523, 530-35 (1994). Commentators disagree whether these differences among and within agencies are problematic. *Compare* Rosenthal et al., *supra* note 47, at 269; and Yang, *supra*, at 530-35; *with* STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION 39-51 (1993).

for example, deems acceptable an increased risk of not more than 1 in 1,000,000 or $1(10^{-6})$.[55] Acceptable risk may also be expressed in narrative form, e.g., "protective of human health with an ample margin of safety."[56] Consequently, while it is sometimes the legislature that chooses a value for acceptable risk, it is, at other times, the administrative agencies implementing health-based environmental standards that translate a narrative instruction into the numbers used in the risk assessment equation. Further, because the costs of protecting human health can in many instances be large, these decisions are not based exclusively on determinations of "acceptable" health risk, but instead are judgments of how much risk is tolerable given that risk attends other costs and benefits of risk-producing activities.[57]

B. *Quantitative Risk Assessment: Critique*

1. *The rationality of quantitative risk assessment.*

Broadly formulated, the ascendancy of quantitative risk assessment in environmental decision making is propelled by the conviction that we need to understand the problem in order to fashion a solution.[58] QRA supporters argue that agencies must establish the existence and magnitude of an exposed population's risk in order to make rational decisions about the need for reducing that exposure.[59] Calls for quantitative risk assessment reflect the currency of the view that policy making ought to be "rational" in the particular sense of proceeding according to prescribed, replicable, quantitative methods.[60] The appeal, in popular terms, is to common sense,

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55. *See* WASH. ADMIN. CODE § 173-340-730(3)(a)(iii)(B) (1999); *see also* Clean Air Act, 42 U.S.C. § 7412(f)(2)(A) (1994).

56. *See, e.g.*, Clean Air Act, 42 U.S.C. § 7409(b)(1) (1994) ("National primary ambient air quality standards . . . shall be ambient air quality standards the attainment and maintenance of which . . . allowing an adequate margin of safety, are requisite to protect the public health."); Lead Industries Ass'n v. EPA, 647 F.3d 1130 (D.C. Cir. 1980).

57. *See* Douglas MacLean, *Social Values and the Distribution of Risk*, *in* VALUES AT RISK 75, 77 (Douglas MacLean ed., 1986).

58. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 16-17.

59. *See id.*; Graham, *supra* note 40, at 389-90.

60. Mark Sagoff contrasts this conception of rationality in regulatory decision making with a conception of rationality that promotes decisions that are "reasoned," "intelligent," and the product of open-minded deliberation and that, importantly, countenances qualitative evidence, including evidence about common purposes and beliefs. MARK SAGOFF, THE ECONOMY OF THE EARTH: PHILOSOPHY, LAW AND THE ENVIRONMENT 12-14, 220-24 (1988); *see also* Kristin Shrader-Frechette, *Evaluating the Expertise of Experts*, 6 RISK: HEALTH, SAFETY & ENV'T 115, 117 (1995) (arguing that "[a]ssessments of multiattribute risks should be the products of social, ethical, cultural and legal rationality—not merely the projects of a

to the need to make "sound" regulatory decisions.[61] Some proponents also press a less benign version of this idea. They argue that agencies ought not to regulate unless and until they can quantify the relationship between harms to humans from exposure to environmental contaminants and the kind and amount of these contaminants attributable to particular sources.[62] This argument, it bears remarking, is troubling in light of our present inability to do the necessary quantification and the enormous gaps in the data on which quantitative risk assessment depends.[63]

Many of those who offer QRA as a decisional tool make ambitious claims about the method.[64] Some proponents believe QRA capable of encompassing every important value—while remaining neutral as to the various claims of value. They argue that values of every sort can unproblematically and comprehensively be quantified and accounted for, at least in theory. Other proponents of QRA make more modest claims.[65] They offer QRA and similar analytic methods only as a means to provide and organize informa-

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bounded scientific rationality."). For other possibilities, see, for example, Jeanne Nienaber Clarke & Andrea K. Gerlak, *Environmental Racism in the Sunbelt? A Cross-Cultural Analysis*, 22 ENVTL. MGMT. 857 (1998); Winona LaDuke, *Traditional Ecological Knowledge and Environmental Futures*, 5 COLO. J. INT'L ENVTL. L. & POL'Y 127 (1994); Tsosie, *supra* note 28, at 268-317.

61. *See* WRITTEN STATEMENT OF THE CHEMICAL MANUFACTURERS ASSOCIATION BEFORE THE SUBCOMMITTEE ON ENVIRONMENT, ENERGY AND NATURAL RESOURCES AND THE SUBCOMMITTEE ON LEGISLATION AND NATIONAL SECURITY, COMMITTEE ON GOVERNMENT OPERATIONS, STATEMENT OF THE CHEMICAL MANUFACTURERS ASSOCIATION ON THE ASSESSMENT AND MANAGEMENT OF HEALTH, SAFETY AND ENVIRONMENTAL RISK (Feb. 1, 1994), *available in* 1994 WL 14167699 ("A sound environmental management strategy must begin by considering the nature and magnitude of the risks to public health and the environment that are presented by particular substances and activities.") [hereinafter CHEMICAL MANUFACTURERS ASSOCIATION TESTIMONY]; Rosenthal et al., *supra* note 47, at 270 ("Scientific information about the human health risks of exposure to toxic chemicals is critical to making sound regulatory decisions.").

62. *See* Richard B. Belzer, *The Peril and Promise of Risk Assessment*, 14 REGULATION 40, 47-48 (1991); CHEMICAL MANUFACTURERS' ASSOCIATION, RISK ASSESSMENT, A FLEXIBLE APPROACH TO PROBLEM SOLVING, 22-24 (1996).

63. *See* Alyson C. Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decisionmaking*, 15 HARV. ENVTL. L. REV. 327, 329-31 (1991) (asserting that given large uncertainty, legislation that has been interpreted to require risk assessment amounts to a resource intensive and time consuming burden of proof on agencies); Ellen K. Silbergeld, *The Risks of Comparing Risks*, 3 N.Y.U. ENVTL. L.J. 405 (1994) ("The anti-regulatory sector has opened its post-Reagan/Bush campaign against environmental regulation with a novel strategy: . . . the new attack sets in the way of regulatory action the prerequisite of having to quantify and prioritize all risks and then to allocate the resources of government and society in a manner accurately commensurate with comparability of risk."); *accord* CHEMICAL MANUFACTURERS ASSOCIATION TESTIMONY, *supra* note 61.

64. *See, e.g.*, MacLean, *supra* note 57, at 77.

65. *See id.* at 77-78.

tion in a manner that permits more systematized choices about the need to reduce human exposures or stem environmental contamination. They hope QRA will discipline the assessment of the tradeoffs involved and thus point to a more efficient allocation of regulatory resources.

However, because quantitative risk assessment and related analytic methods frame questions, characterize relationships and presuppose societal ends, the choice to make environmental policy decisions by QRA is a choice of one particular conception of the good and one subjective set of priorities and assumptions. Far from permitting humans to "get beyond a clash of sacred values," quantitative risk assessment and related analytic approaches simply instate one view of the sacred.[66] The choice of QRA presupposes, for example, that "optimal" pollution or risk control is the end to which environmental policy aspires.[67] It assumes that there is no reason nor relationship that would call for limits on anthropogenic chemical contamination even when risk does not exceed "acceptable" levels.[68] Moreover, it excludes all experience or understanding that is not amenable to quantification.[69]

In fact, there is reason to doubt proponents' boast that QRA can account comprehensively for every value, all the while remaining neutral. Cass Sunstein's work on the problem of incommensurability in law is instructive here.[70] Sunstein observes that humans value things, goods, relationships, and states of being in qualitatively different ways[71] and notes that these values cannot without significant loss be reduced to a single metric, such as money or utility.[72] The attempt to account comprehensively for every value along a single metric may, for some values (and valuators) in some contexts, do violence to the way that those values are actually understood and experienced. Not only would the metric fail adequately to describe experience but also, crucially, it "would actually transform it, in a way that would make a great deal of difference . . .

66. *See* Annette Baier, *Poisoning the Wells*, *in* VALUES AT RISK, *supra* note 57, at 49, 51.

67. *See* WILLIAM BAXTER, PEOPLE OR PENGUINS? THE CASE FOR OPTIMAL POLLUTION (1974). *But cf.* CRITFC Comments, *supra* note 1, at 3 (arguing for "zero tolerance").

68. *See* PLATER ET AL., *supra* note 9, at 449; Graham, *supra* note 40, at 389-90. *But cf.* CRITFC Comments, *supra* note 1, at 11-12.

69. *See* Williams, *Large Binocular Telescopes*, *supra* note 31, at 1134-36, 1149-50, 1153-59, 1161-63.

70. *See* Cass R. Sunstein, *Incommensurability and Valuation in Law*, 92 MICH. L. REV. 779 (1994); *see also* Symposium, *Law & Incommensurability*, 146 U. PA. L. REV. 1169 (1998).

71. *See* Sunstein, *supra* note 70, at 782.

72. *See id.* at 784.

because it would elide certain qualitative differences that are important in both life and law."[73]

Thus any risk assessment that purported to be comprehensive would need to take into account some values that are not susceptible to the requisite quantification, at least not without significant loss. However, for at least some people, to ask how much risk is acceptable or how much contamination is optimal is to ask an unintelligible or morally objectionable question. For some values in some contexts, QRA will fall short as a descriptive matter; and to the extent that it succeeds in this descriptive task, it may have failed to retain its purportedly neutral posture.

In general, it should be recognized that there are other approaches to living a human life, other views of the sacred, than the one presupposed by QRA. Finally, there remains the question that QRA does not claim to ask—that of the distribution of the risks deemed acceptable in the aggregate. Many of these points have been developed elsewhere.[74] I mention them briefly as background for the immediate concern that QRA as practiced produces environmental standards that underprotect highly-exposed subpopulations, especially Native Americans. But even this sketch of QRA in context illuminates serious concerns about the transformative potential of QRA and related analytic methods.

2. *The malleability of quantitative risk assessment.*

QRA in practice is exceedingly malleable. Risk assessors must make subjective judgments at numerous junctures in the risk assessment process. Some of these judgments are necessitated by the present lack of the data on which QRA depends for its claimed value as a useful arbiter.[75] And, even in cases where data exist—for example, where the value for some parameter in the risk assessment equation is known, but known to vary—current practice leaves it to risk assessors to choose among a range of true values.[76] These occasions for judgment in QRA are termed, respectively, "uncertainty" (incomplete data) and "variability" (known, but several values). Such subjective judgments imbue the process with the

73. *Id.* at 797.

74. In addition to the sources cited at notes 61, 67-74, see Kuehn, *supra* note 26, the essays in VALUES AT RISK, *supra* note 57, and the essays in ACCEPTABLE EVIDENCE: SCIENCE AND VALUES IN RISK MANAGEMENT (Deborah G. Mayo and Rachelle D. Hollander, eds. 1991).

75. *See infra* notes 112-14 and accompanying text for explanation of uncertainty.

76. *See infra* notes 115-22 and accompanying text.

particular values, commitments and experience of the risk assessor and can profoundly affect the outcome of each risk assessment.[77]

The extraordinary latitude for subjective judgment is one of the main bases for criticism of QRA, by proponents and detractors alike. The criticism that risk assessment is fraught with uncertainty is by now a familiar one.[78] Sources of uncertainty in the first step of risk assessment, hazard identification, include large gaps in epidemiological data and in other, surrogate sources of knowledge about whether a chemical agent is likely to have hazardous effects in humans.[79] For example, whether an agent has chemical or physical properties that produce adverse effects in humans is known for relatively few chemicals, compounds, or mixtures; in most cases, risk assessors must rely on proxies, in the form of a structural comparison of the unknown agents with known hazardous agents.

In the second step, dose-response assessment, the absence of human epidemiological data about the dose-response relationship for most agents introduces substantial uncertainty. Risk assessors in most cases must extrapolate from animal tests to humans.[80] Further, for reasons of research efficiency and administrability, these animal tests typically expose animals to much higher doses—perhaps a thousand times greater—than the doses experienced by humans in the environment. As a result, conversion to dose-response curves for humans requires extrapolation from high-dose experiments to low-dose scenarios for which experimental data do not exist.[81] Together, these extrapolations create perhaps the greatest source of uncertainty in the risk assessment process.[82]

The third step, exposure assessment, is also riddled with uncertainty.[83] Often little is known about the fate (including biodegradation and bioaccumulation) and transport of

77. *See* Kuehn, *supra* note 26, at 138-39 (giving examples of wildly different outcomes depending on who conducts the risk assessment); *see also* Alon Tal, *Assessing the Environmental Movement's Attitudes Towards Risk Assessment*, 31 ENVTL. SCI. & TECH. 470, 475 (1997) ("One experienced public interest attorney notes, 'I have never seen nor have I heard from my colleagues of a single instance where an industry-sponsored risk assessment has indicated that a problem exists.'").

78. *See* Flournoy, *supra* note 63, at 327 n.1 (citing a considerable body of literature discussing uncertainty in risk assessment); Yang, *supra* note 54, at 527-30; BREYER, *supra* note 54; Kuehn, *supra* note 26.

79. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 57-58, 163 (Table 9-1).

80. *See id.* at 58-60, 163 (Table 9-1).

81. *See id.*

82. *See id.* at 59; *see also* Shere, *supra* note 39, at 432-40.

83. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 43-55, 164.

contaminants of concern from the time they are released in the environment to the time of human exposure. In addition, there may be wide variability in exposure and susceptibility among individuals, but often little data describing the variability. In short, risk assessment's claimed objectivity and usefulness depends on the availability of large amounts of data at each of the first three steps in the process. At present, much of the necessary data simply has not been gathered.[84]

An example of agency judgment is illustrative. At present, risk assessors are utterly unable to account completely for synergistic or antagonistic interactions among the multiple chemicals to which an individual is exposed. Although they are aware of likely synergisms, risk assessors are unable to quantify these chemical interactions in a manner that would permit the interactions to be figured into current risk assessment methods. Instead, agency risk assessors have chosen to proceed chemical by chemical, constructing a hypothetical and unrealistic world in which humans are exposed to single chemicals. To the extent that *cumulative* risks are recognized, they are calculated by adding together the separate risks of exposure to single chemicals.[85] The effect of assuming additivity where synergism correctly describes the interaction of multiple chemicals, of course, is to underestimate the risk of those exposed to the mix.

Although cognizant of the present large chasms in the available data, health and environmental regulatory agencies nonetheless have chosen to employ the risk assessment technique in environmental decision making. This choice alone sparks criticism from detractors; for example, some claim that risk assessment serves largely to impede rather than improve health and environmental regulation.[86] Proponents, however, believe the present deficiencies only a matter of QRA's nascency. The response, from their perspective, is to develop and fine-tune the tool.[87]

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84. As currently written, moreover, many health and environmental regulations actually create *disincentives* for information gathering. If there is little or no information regarding human carcinogenicity for a potential environmental hazard, for example, the EPA effectively assumes that there is zero risk from that substance. Consequently, those producing potentially hazardous substances may fear that new information can only make things worse because it may identify a negative health effect and subject the substance to regulation. *See* Guidelines for Carcinogen Risk Assessment, 51 Fed. Reg. 33,992, 33,996–34,000 (1986); *see also* Kuehn, *supra* note 26, at 154.

85. *See* Kuehn, *supra* note 26, at 117-21.

86. *See* Flournoy, *supra* note 63, at 334-38, 340-46; Silbergeld, *supra* note 63, at 406.

87. For example, they urge that uncertainty be reduced by gathering data, and that

If it is recognized that risk assessment requires so many subjective calls—calls inevitably imbued with the personal values and commitments of the risk assessor—risk assessment stands to lose its authority as a value-free arbiter. Indeed, for quantitative risk assessment to retain its authority, advocates must deny or downplay the subjectivity of the process.[88] The subjectivity of risk assessment as practiced fuels both the claim that risk assessment overstates the risks to society from environmental hazards, leading to over-regulation of risk-producing processes,[89] and the claim that risk assessment understates these risks, leading to underregulation of risk-producing processes.[90] Either way, there is ample reason to question whether the numerous subjective judgments that accompany risk assessment are appropriately accounted for in current practice.

3. *Implications for environmental justice.*

Many of the criticisms outlined in the preceding Parts are amplified when the risk-bearing communities are Native Americans, other communities of color, and low-income communities. Some of these affected communities have raised this point.[91] A few commentators have joined in emphasizing the particular problems QRA poses for these communities.[92]

QRA has not been able to deliver the objectivity that a few com-

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variability be accounted for by using Monte Carlo-type analysis of probabilities. *See* Graham, *supra* note 40; CHEMICAL MANUFACTURERS ASSOCIATION TESTIMONY, *supra* note 61. But note that it is precisely the time- and resource-intensive aspects of calls for more data and greater sophistication that have lead detractors to question some proponents' motives. *See* Flournoy, *supra* note 63; at 382-91; Silbergeld, *supra* note 63, at 416-23.

88. *See* DALE JAMIESON, ETHICS 477 (1996).

89. *See* Belzer, *supra* note 62, at 46 (noting that risk assessors "account for what they cannot estimate by intentionally exaggerating what they can"); Albert L. Nichols & Richard J. Zeckhauser, *The Perils of Prudence: How Conservative Risk Assessments Distort Regulation*, 8 REG. TOXICOLOGY & PHARMACOLOGY 61 (1988); Richard J. Zeckhauser & W. Kip Viscusi, *Risk Within Reason*, 248 SCIENCE 559, 562 (1990).

90. *See, e.g.*, John C. Bailar, III et al., *One-Hit Models of Carcinogenesis: Conservative or Not?*, 8 RISK ANALYSIS 485, 497 (1988) (arguing that although the one-hit model of carcinogenesis that is currently in use is considered to be the most conservative model, it "may substantially understate true risks at low exposures"); Adam M. Finkel, *Is Risk Assessment Really Too Conservative? Revising the Revisionists*, 14 COLUM. J. ENVTL. L. 427, 439-43 (1989) (noting that although extrapolation from animal data is often alleged to overestimate risk, there is reason to believe that the use of animal data may actually underestimate the magnitude of many risks to humans); Ellen K. Silbergeld, *Risk Assessment: The Perspective and Experience of U.S. Environmentalists*, 101 ENVTL. HEALTH PERSP. 100, 101 (1993).

91. *See, e.g.*, CRITFC Comments, *supra* note 1, at 2-3, 10-11.

92. Robert Kuehn and Kristin Shrader-Frechette have been prominent voices to this end. *See* Kuehn, *supra* note 26; Daniel C. Wigley & Kristin Shrader-Frechette, *Environmental Racism and Biased Methods of Risk Assessment*, 7 RISK: HEALTH, SAFETY & ENV'T 55 (1996); *see*

mentators believed would usefully reveal the disproportionate risks borne by communities of color and low-income communities. Some proponents of QRA had contended that once risk assessment identified and quantified the increased risks borne by people of color and people with lower incomes, greater public health and environmental agency attention and resources would be directed toward these problems, thereby reducing risks for these groups.[93] But, as noted above, QRA is not the objective tool proponents hold it out to be.[94] While the lack of objectivity is a disappointment for those who had looked to QRA to improve decision making, the disappointment is more than a matter of academic concern for those who must bear the risks, as the promised redirection of resources and reduction of risks has not occurred.

In fact, rather than revealing distributional inequities in public risk, health and environmental agencies' current use of QRA may obscure and even exacerbate these inequities.[95] Some commentators point to serious limitations in both the method and use of QRA that result in risk characterizations that considerably underestimate the scope and magnitude of the risks encountered by people of color and low-income communities.[96] For example, while quantitative risk assessment's failure to account for the synergistic effects of multiple exposures is a shortcoming of the method generally, this shortcoming disproportionately impacts some Native Americans, people of color and people in low-income communities, given their exposure via multiple routes to a wider mix of chemicals—either the urban toxic soup or the rural pesticide slurry.[97] This may be an example of the point that risk assessors are likely to bring their own commitments and experience to the

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also Brian D. Israel, Note, *An Environmental Justice Critique of Risk Assessment*, 3 N.Y.U. ENVTL. L.J. 469 (1995).

93. *See* Kuehn, *supra* note 26, at 140.

94. *See supra* notes 75-90, and accompanying text.

95. *See* Kuehn, *supra* note 26, at 140.

96. *See id.* at 116-29.

97. *See, e.g.*, CRITFC Comments, *supra* note 1, at 7-10 (pointing out multiple routes of tribal members' exposure to waterborne toxics: in addition to ingestion of fish and intake of water, for example, "[t]ribal members engaging in a variety of river activities such as fishing, pulling in fishing nets, launching boats and cleaning fish and fishing equipment are invariably exposed to dermal absorption of contaminated water;" pointing out synergistic effects of multiple exposures; and pointing out significant underlying health problems and socio-economic variables among tribal members); SHIPRA BANSAL & SAM DAVIS, HOLDING OUR BREATH: ENVIRONMENTAL INJUSTICE EXPOSED IN SOUTHEAST LOS ANGELES: AN ASSESSMENT OF CUMULATIVE HEALTH RISK AND LOCAL AIR POLICY 25 (1998). Given the current lack of data regarding synergism and antagonism, it is difficult to say how great this burden

judgments they must make in the face of data gaps. To the extent that agency risk assessors' experiences do not reflect those of the exposed communities, it may be difficult for them to imagine the lives of those affected.[98] Also, to the extent that agency risk assessors' shared education, training, and predispositions affect their observations of the world, they may not be aware of the need to reevaluate accepted practice.[99]

Moreover, given the highly technocratic, resource-intensive nature of QRA as practiced, affected individuals and communities are often the least well equipped to participate meaningfully in public debate about inputs to the quantitative risk assessment and to challenge the numerous assumptions and judgments that are made by agencies in the process.[100] Risk producers, by contrast, are typically well-versed in the language of QRA and typically bring this facility to bear on agency decision makers. Given the considerable room for judgments in the process and the profound effects of such judgments on the outcome, the disparity in influence between risk bearers and risk producers is likely to translate into less protective rather than more protective outcomes.[101] Because of the exclu-

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is; even conservative estimates, however, suggest reason for concern. *See, e.g.*, Kuehn, *supra* note 26, at 119-21.

98. *See, e.g.*, CRITFC Comments, *supra* note 1, at 10 ("When considering routes of exposure, EPA must also expand its risk assessment methodologies to include cultural practices and lifestyles. Tribes and other relevant populations should be consulted regarding these potential exposure routes which may not even exist among the general population.").

99. Agency risk assessors are typically "expert" practitioners of QRA and, as Clayton Gillette and James Krier explain,

> proceed within the framework of their education and training . . . which are replete . . . with given abstractions, principles, and commitments. Experts learn within a setting of shared conceptions that they come themselves to share, and this necessarily shapes, in an extraordinarily durable way, their views of the world. The 'facts' experts observe are regularly 'inseparable' from the 'values' they hold, 'particularly when the facts in question refer to predictions of likely consequences in a highly uncertain environment.'

Clayton P. Gilette & James F. Krier, *Risk, Courts and Agencies*, 138 U. PA. L. REV. 1027, 1098 (1990) (quoting Lawrence Tribe, *Policy Science: Analysis or Ideology?*, 2 PHIL. & PUB. AFF. 66, 99 (1972)).

100. *See* CRITFC Comments, *supra* note 1, at 9 ("[M]any tribes and other highly-exposed subpopulations may not be afforded the resources of conducting the fish/shellfish consumption surveys . . ."); Tal, *supra* note 77, at 475 ("With few exceptions, grassroots organizers lack the resources to conduct independent [risk] analyses. [Even at] the national level, environmental groups do not believe that they can consistently wield the toxicological and statistical expertise necessary to compete successfully in the deliberations about how risk assessment is done.").

101. Kuehn, *supra* note 26, at 129-39.

sionary nature of the decision making process,[102] the very risk-bearers whose voices are most marginalized are likely to receive the least protection.[103] A related point, elaborated by Eileen Gauna and other commentators, is that the decision making process itself may be rendered exclusionary.

Finally, as noted above, QRA rests on a set of premises, including basic ideas about how humans should live. Tribes, environmental justice advocates, and indigenous rights advocates have bridled at this view of the world, and consequently have questioned methods built upon these premises.[104] From its assumption that there is an "acceptable" level of risk, to its requirement that a whole host of experiences be quantified, to its acceptance of only certain kinds of knowledge, QRA may do violence to the lives that are lived or envisioned by some communities. Moreover, the potential of QRA to transform experience as it claims merely to measure it is especially problematic in a multicultural society. In the case of Native Americans, this imposition echoes other assimilative acts and policies of cultural discrimination.[105]

The criticisms outlined above have prompted some commentators to oppose recourse to QRA altogether.[106] Some commentators oppose even discussing how to improve QRA in practice, because the method and its premises are fundamentally flawed or morally wrong.[107] Given QRA's current favor as a decisional tool, however, the most immediate task for environmental justice advocates may be to understand how risk assessment works to effect in-

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102. *See, e.g.*, Eileen Gauna, *The Environmental Justice Misfit: Public Participation and the Paradigm Paradox*, 17 STAN. ENVTL. L.J. 3 (1998).

103. *See, e.g.*, Kuehn, *supra* note 26, at 129-33; BANSAL & DAVIS, *supra* note 97, at 21.

104. *See, e.g.*, CRITFC Comments, *supra* note 1, at 10-12 BANSAL & DAVIS, *supra* note 97, at 27 ("Amidst all the controversy [about risk assessment], however, let us not lose sight of the fact that our long-term goal is not 'managed' risk, but zero risk, with source reduction as the key focus.").

105. S. James Anaya, *Ethnic Group Rights*, *in* ETHNICITY AND GROUP RIGHTS NOMOS XXXIX at 228-29 (Ian Shapiro & Will Kymlicka eds., 1997); Williams, *supra* note 25, at 284-89.

106. *See* CRITFC Comments, *supra* note 1, at 3 (stating that "CRITFC maintains that risk assessments have no useful purpose for making regulatory decisions for persistent, bioaccumulative toxics, known carcinogens, 'probable human carcinogens,' and substances known to cause reproductive, developmental or neurological effects: the science is always debatable and risk assessment involves inherent uncertainties."); *Headlines: Dioxin and Precaution*, RACHEL'S ENV'T & HEALTH WKLY. # 653 (electronic ed. Jun. 3, 1999) (arguing that risk assessment is morally problematic and ought to be rejected in favor of the "precautionary principle.").

107. *See, e.g.*, Lois Gibbs, *Risk Assessments from a Community Perspective*, 14 ENVTL. IMPACT ASSESSMENT REV. 327 (1994).

justice in order to recommend changes in the way that agencies use risk assessment.

In this vein, I will turn in Part III to a discussion of agencies' use of QRA to set human health-based standards to address human exposure to toxic contaminants via the fish ingestion pathway. An important but underexplored criticism of QRA is that it does not now adequately account for interindividual variability in exposure.[108] Because fish consumption practices vary and because some Native Americans are among the most highly exposed,[109] this failure visits especially harsh consequences on those peoples. In the next Part, I elaborate and distinguish between "uncertainty" and "variability," two concepts important to understanding agencies' underestimation of risk to Native Americans of the Pacific Northwest.

C. *Problems in Accounting for Uncertainty and Variability*

Each nontrivial parameter considered in the risk assessment equation may be characterized by uncertainty; some parameters may also be variable. If risk assessors in health and environmental agencies select a single value for a parameter that is characterized by uncertainty or by variability, their resulting assessment of risk will be inaccurate in some measure. The nature of the error, however, is quite different in cases of uncertainty and cases of variability. Considerations bearing on regulatory responses to uncertainty thus differ from those bearing on responses to variability.[110] In order to evaluate appropriate regulatory responses, it is critical to understand exactly what uncertainty is, and what variability is.

1. *Uncertainty.*

Uncertainty, in general terms, is the lack of precise, complete knowledge of the true answer to a question. Here, the question is the value for some parameter in the risk assessment equation.[111]

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108. *See* Israel, *supra* note 92, at 494-503; *see also* Adam M. Finkel, *A Second Opinion on an Environmental Misdiagnosis: The Risky Prescriptions of Breaking the Vicious Circle*, 3 N.Y.U. ENVTL. L. J. 295, 345-48 (1994). *But cf.* Bansal & Davis, *supra* note 97, at 25-55.

109. *See infra* Part III. For the remainder of this Article, a statement to the effect that "Native American or other subpopulations occupy the high end of the exposure distribution for fish consumption" refers to a hypothetical frequency distribution for exposure, such as might be constructed by piecing together qualitative and quantitative evidence of fish consumption from an array of independent samples.

110. *See* discussion *infra* Part IV.C.

111. *See, e.g.*, SCIENCE & JUDGMENT, *supra* note 43, at 160-87.

For each non-trivial parameter in the risk assessment equation, there may be large gaps in the knowledge necessary to determine the correct or true value for that parameter. An agency risk assessor's choice for the cancer potency factor, for example, is riddled with uncertainty stemming from, among other things, an incomplete understanding of carcinogenesis.[112] Although scientists concede that uncertainty exists in any quest for "truth," and even science's more certain understandings are constantly subject to revision, the National Research Council ("NRC") of the National Academy of Sciences has called the gaps in the data necessary for quantitative health risk assessment "uniquely large."[113] According to the 1983 NRC report "Risk Assessment in the Federal Government," "[t]he dominant analytic difficulty [in decision making based on risk assessments] is pervasive uncertainty . . . in estimates of the types, probability, and magnitude of health effects associated with a chemical agent" as well as in estimates of other parameters in the risk assessment equation.[114]

2. *Variability.*

Variability refers to the fact that there is no single, correct answer to a question—again, in this case, the value for some parameter in the risk assessment equation. Rather, a range of values comprises the true answer. Importantly, these different values *each* describe an *actual, known* answer to the question. The true value for a parameter that is variable may thus be represented by a distribution (as opposed to a single point). The term "variability" is used to refer both to the differences in and resulting dispersion of actual values of some quantity being measured.[115] To illustrate, the exact distance between the earth and the moon is variable, because the moon's orbit is elliptical not circular.[116] Because of variability, the question "What is the distance between the moon and the earth?" cannot be answered both simply, i.e., with a single value, and correctly. The quest for a "true" answer to this question permits only two satisfactory responses: gather more data or rephrase the question. For example, either enough data must be obtained to give an answer of the form 'The distance ranges between

112. *See* A. Fan et al., *Risk Assessment of Environmental Chemicals*, 35 ANN. REV. PHARMACOL. TOXICOL. 341, 355-60 (1995).

113. *See, e.g.*, SCIENCE & JUDGMENT, *supra* note 43, at 161.

114. *Id.* at 160.

115. *See, e.g., id.* at 188-223.

116. I borrow this illustration from *id.* at 189-91.

221,460 and 252,710 miles' or 'The moon's orbit is approximately elliptical, with a minor axis of 442,920 miles, a major axis of 505,420 miles, and an eccentricity of 0.482,'[117] or the question must be reduced to one with a single right answer (e.g., 'How far away is the moon from the earth at its perigee?').[118]

Interindividual variability refers to differences between individuals.[119] Two sorts of interindividual variability are relevant to predicting risk to humans from environmental hazards: variability in *susceptibility*, that is, differences among individuals in the biologically effective dose per unit exposure to a hazardous substance;[120] and variability in *exposure*, that is, differences among individuals' contact with a hazardous substance at some nonzero concentration.[121] While some commentators have pointed out that QRA may not account adequately for variability in susceptibility in ways that lead to environmental injustice,[122] this Article focuses on how QRA accounts for variability in exposure. Variability is a notable feature of several parameters in the exposure portion of the risk assessment equation. Examples include differences in exposure per unit of ambient concentration of hazardous air contaminants (resulting from factors determining an individual's likely location, e.g., living downwind of an industrial source versus living upwind of such a source) and differences in exposure to hazardous water contaminants that bioaccumulate in fish (resulting from factors determining an individual's likely fish consumption patterns).[123]

In this Part, I have highlighted a few criticisms of agencies' current tool of choice for setting health-based environmental standards. QRA proceeds according to a particular rationality—one that may not be shared by risk bearers—and QRA's malleability renders it susceptible to judgments that do not reflect the experience of risk-bearing subpopulations. These criticisms are particularly relevant where the risk-bearers are Native Americans because they illuminate the large opportunities that exist for discrimination

117. Note that this second formulation gives a better picture of the correct answer to the question to the extent that it gives more information about the actual values that comprise the range or distribution. This observation becomes important in cases of variability where the distribution is non-standard.

118. SCIENCE & JUDGMENT, *supra* note 43, at 191.

119. I will use the terms "interindividual variability" and "variability" interchangeably for the remainder of this article to refer to interindividual variability.

120. *See* SCIENCE & JUDGMENT, *supra* note 43, at 200-03.

121. *See id.* at 196-200.

122. *See* Kuehn, *supra* note 26, at 121-26.

123. *See* SCIENCE & JUDGMENT, *supra* note 43, at 196-97.

against, indifference toward, or misunderstanding of Native fish consumption practices.

III. Fish Consumption

Native Americans of the Pacific Northwest have different fish consumption practices and consume fish at much higher rates than the "average American" assumed by health and environmental agencies. Indeed, many individuals of these Pacific Northwest peoples consume fish at rates ten times that of the EPA's "average American" and some individuals consume fish at rates more than one hundred times that of EPA's assumed rate.[124] This significant difference in consumption rates is perhaps unsurprising, given the significant difference between the cultural importance of fish, fishing and fish consumption for these Native peoples and for most Anglo-European Americans.

Although there is abundant evidence of Native Americans' relatively higher fish consumption, agency risk assessors discount much of this evidence as "anecdotal." Because quantitative risk assessment demands quantified inputs, agency risk assessors have refused to count this anecdotal data. Rather, citing a lack of real "data," they have persisted in employing standard assumptions based on the consumption practices of the "average American." In an effort to have their higher consumption—and thus their increased exposure—taken into account, some tribes have recently undertaken studies to quantify what they already know about their fish consumption patterns. The existence of this quantitative data poses issues that agency risk assessors can no longer ignore.

This Part begins in Part III.A by relating historical and contemporary accounts of the importance of fish and salmon to the Pacific Northwest peoples. Part III.B sets forth the portion of a typical risk assessment equation that accounts for exposure, in order to show how estimates of risk are affected by changes to the fish consumption rate. This Part further explains three relevant elements in the equation: the bioconcentration or bioaccumulation factor; the fish consumption rate; and, the diet fraction. Part III.C recounts agencies' and courts' reluctance to hear or accept data of fish consumption practices in non-quantified form. Part III.D canvasses fish consumption studies relevant to Puget Sound and the Columbia River Basin.

124. *See infra* Table 1.

A. *The Importance of Fish, Fishing, and Fish Consumption to Pacific Northwest Native Peoples*

Fish, fishing, and fish consumption define the first peoples of the Pacific Northwest. Del White, Nez Perce, explains, "People need to understand that the salmon is part of who the Nez Perce people are. It is just like a hand that is part of your body . . . ."[125] The importance of fish, especially salmon, to the first peoples of the Pacific Northwest is reflected in myth,[126] in language,[127] in treaties negotiated with the invading peoples,[128] in past and present fisheries management practices,[129] in contemporary restoration efforts,[130] and in the ongoing legal and political struggle for the survival of the salmon and the way of life that is bound up with fish

125. DAN LANDEEN & ALLEN PINKHAM, SALMON AND HIS PEOPLE: FISH & FISHING IN NEZ PERCE CULTURE 156 (1999).

126. *See, e.g.*, EUGENE S. HUNN WITH JAMES SELAM & FAMILY, NCH'I-WANA "THE BIG RIVER": MID-COLUMBIA INDIANS AND THEIR LAND, 154-55 (1990) (relating how Coyote brought salmon to the river people); Martin J. Sampson, as told to Rosalie M. Whitney, *The Maiden of Deception Pass,* THE SWINOMISH TOTEM POLE: TRIBAL LEGENDS (pamphlet on file with the author).

127. *See, e.g.*, HUNN ET AL., *supra* note 126, at 58-88, 151-52 and Table 14

128. Donald A. Grinde and Bruce E. Johansen offer one account:

> During [1854 & 1855], Governor Stevens wrested from the Indians most of the land of the present-day states of Montana and Idaho, as well as that of eastern Washington. In all the treaties Stevens drove an extremely tough bargain, but the Indians would not relent on one point: the continued right to fish. After signing the Medicine Creek Treaty on December 26, 1854, Stevens said: 'It was also thought necessary to allow them to fish at all accustomed places, since this would not in any manner interfere with the rights of citizens and was necessary for the Indians to obtain a subsistence . . . .'
>
> The treaty, signed on a small island surrounded by salt marshes not far from the present-day state capital, Olympia, guaranteed the Indians the right to fish at their usual and accustomed places 'in common with' citizens of the territory. By signing the treaty, the Indians ceded to the United States 2,240,000 acres of land, an immense sacrifice for the right to fish.

DONALD A. GRINDE & BRUCE E. JOHANSEN, ECOCIDE OF NATIVE AMERICA: ENVIRONMENTAL DESTRUCTION OF INDIAN LANDS AND PEOPLES 147 (1995); *See* Videotape: Empty Promises, Empty Nets (Columbia River Inter-Tribal Fish Commission 1994) [hereinafter Empty Promises, Empty Nets].

129. *See, e.g.*, Muckleshoot Indian Tribe v. Moses, No. MUC-CrF-7/88-145 (Muckleshoot Tr. Ct. App., Apr. 19, 1989), 16 INDIAN L. REP. 6073 (discussing regulation of the fishery and management of the resource under the Fishing Ordinance for the Muckleshoot Tribe); HUNN ET AL., *supra* note 126, at 153-54; *See also,* Videotape: A Matter of Trust (Columbia River Inter-Tribal Fish Commission 1995) (Videotaped statements of Delbert Frank, Sr., Warm Springs Fish and Wildlife Commission, and Allen Slickpoo, Sr., Ethnographer, Nez Perce Cultural Resources) [hereinafter A Matter of Trust].

130. *See, e.g.*, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, WY-KAN-USH-MI WA-KISH-WIT (SPIRIT OF THE SALMON): THE COLUMBIA RIVER ANADROMOUS FISH RESTORATION PLAN OF THE NEZ PERCE, UMATILLA, WARM SPRINGS, AND YAKAMA TRIBES (1995).

and the salmon.[131]

The traditional and contemporary observance of the First Salmon Ceremony is one mark of the cultural importance of the salmon to the various peoples of the Pacific Northwest. The particular practices that celebrate the arrival each year of the anadromous salmon differ from tribe to tribe. These practices have also changed over time. Although it is perhaps not possible for nonmembers to appreciate fully the significance of these practices,[132] a small sampling of accounts may nonetheless permit some sense of the cultural importance of salmon. William W. Elmendorf recorded this narrative in 1940 by Henry Allen, a Skokomish, of a First Salmon Ceremony:

> The Twana used to have a ceremony when the first salmon came. There is a deformed-nose fish, a crooked-nose fish, a salmon with deformed jaws. He is the chief of fish. The crooked-nose fish bring the salmon with them when they run. That crooked-nose fish is called yabu's. Duckabush (dəx^{w}yabu's) on the canal is supposed to be the best place for these.
>
> When they caught this deformed-nose fish they had a ceremony. They split him down the back and took out the backbone. Then they spread the rest of the fish out and cooked him, all of him, bones and tail and all. He was cooked by the family that caught him. The backbone they cooked separately.
>
> This first salmon was just for the children, the boys and girls of the village. They laid him down and ate him on the beach where he was cooked. When he was all eaten each child took one of the cooking spits crossways in his teeth, and dashed into the water

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131. Billy Frank, Jr., a Nisqually, recalled his experiences growing up during the fishing wars:

> 'I went to jail when I was fourteen years old. That was the first time I ever went to jail for treaty rights. The State of Washington said I couldn't fish on the Nisqually River. So, at fourteen, I went to jail. Ninety times I went back to jail. The State of Washington said 'you can't go on that river and go fishing anymore.' That's what they told us Indians. 'If you go on that river, you're going to jail.' We went back fishing and we went to jail over and over until 1974.'
>
> The fish-ins continued until February 12, 1974, when U.S. District Court Judge George Boldt ruled that Indians were entitled to an opportunity to catch as many as half the fish returning to off-reservation sites which had been the 'usual and accustomed places' when the treaties were signed.

GRINDE & JOHANSEN, *supra* note 128, at 150-52. *See generally* Institute for Natural Progress, *In Usual and Accustomed Places: Contemporary American Indian Fishing Rights Struggles*, *in* THE STATE OF NATIVE AMERICA: GENOCIDE, COLONIZATION, AND RESISTANCE 217 (M. Annette Jaimes ed., 1992); CHARLES F. WILKINSON, CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST, at ch. 5 (1992); Empty Promises, Empty Nets, *supra* note 128.

132. *See generally* Martin C. Loesch, *The First Americans and the "Free" Exercise of Religion*, *in* NATIVE AMERICAN CULTURAL AND RELIGIOUS FREEDOMS 19 (John R. Wunder ed., 1996).

> and splashed around, and then threw the spit in the direction the chief of the salmon had come from. They thanked him and invited him to come again. There was no song with this.
>
> They laid the backbone on a log or a rock on the beach, pointing to where he had come from. Then his soul would go back to the home of the salmon. They just did this with the first crooked-jawed salmon of any kind that came. It could be done with the first yabu's of each kind of salmon. They ate even the skin and the head, ate him all up. Every child in the village had to eat some of the fish. This was to bring the run the next year.[133]

An account of a contemporary Quileute First Salmon Ceremony in 1998 is offered by Debbie Preston:

> The Quileute children were the focus of the First Salmon Ceremony in LaPush this year. The strength of the Quileute cultural programs was displayed for the elders as dozens of children sang ancient songs and danced prior to participating in the First Salmon Ceremony April 29. The day began Elders Week, which celebrates and honors the elders each year. The First Salmon Ceremony honors the First Salmon, a salmon scout for the Salmon People. Tribal legend taught that if he is well received and treated, he will return to his salmon people and bring them back to tribal waters in abundance. Lillian Pullen, 87, passed her knowledge of the ceremony on to relatives Sharon Pullen and Rosalie Guerrero so they could conduct it this year. Pullen, a cultural cornerstone of the tribe, assisted children with cedar weaving and regaled them with stories and they came up to hug her. Lillian Pullen watched with pride as her kin walked in front of a parade of children with the salmon to the water's edge after saying a prayer. The salmon was given to children in a canoe piloted by Quileute tribal member Tom Jackson. After paddling out from the dock, the salmon was returned to the river by floating the platform of salmon on the water, then tipping it to return it to its home.[134]

The Columbia River Inter-Tribal Fish Commission has offered this description of a recent first salmon ceremony:

> The Washat service, the longhouse, and the seven drums are all part of the traditional religion of the Columbia River tribes. Before tribal celebrations, commemorative or memorial services,

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133. WILLIAM W. ELMENDORF, TWANA NARRATIVES: NATIVE HISTORICAL ACCOUNTS OF A COAST SALISH CULTURE 254 (1993) (citations omitted). Elmendorf notes: "In this book, the term *Twana* refers to a speech community of Coast Salish Indians in the Hood Canal region of western Washington, between Puget Sound and the Olympic Peninsula . . . . Before about 1860, the Twana were divided into nine village communities, of which the Skokomish was the largest." *Id.* at xxix. Other Twana communities included the Babop, Quilcene, Dosewallips, Buckabush, Hoodsport, Vance Creek, Tahuya, and Duhelap.

134. Debbie Preston, *First Salmon Ceremony Binds Children, Elders* (visited Sept. 21, 1998) <http://www.nwifc.wa.gov/newsletter/salmon_ceremony.htm>.

> Washat prayers are offered. Water is the most essential part of all longhouse rituals and has a deep symbolic significance for tribal people.
>
> One of the most important service is the First Food Feast. This ceremony must occur before hunting, fishing, root digging, or gathering can take place. The following is a description of a First Food Feast held to celebrate the return of the salmon on May 1, 1994 at Willamette Falls, Oregon.
>
> Standing shoulder-to-shoulder in two circles—women on the south and men on the north—tribal and non-tribal participants gathered inside the longhouse-style tent to witness the religious service.
>
> Drummers, in line at the front of the longhouse, began a series of prayer-songs. To their right, Tony Washines, Yakama longhouse leader, held a brass bell, ringing it and using it to count the song sequences. During the service, Washat members sang, while some danced, moving with small dignified steps. Some of the songs thanked the salmon for giving its life to feed the people while others reminded the Indian people of the traditional laws that must be observed.
>
> "When the Creator created our Mother Earth, He gave it life," explained Washines. "When the dawn comes on this sacred day, the light of our Father is here. This life is a sacred inherent right of our people. These songs speak of this life from the time that life began. We've always been alongside the animals, the trees, the grass, and all the roots that make the medicines and foods." He said that tribal people hold all these in great reverence, "because they too have a purpose—to nourish and strengthen our hearts, our minds and our bodies."
>
> While the songs were still being sung, food servers, both young women and men, gradually brought you the food and set it in front of all those assembled inside and outside the longhouse. Before the meal was eaten, Washines rang the bell as a signal for everyone to stand and join in prayer-song. The bell rang again, and participants picked up their cups of water and drank. After the traditional meal of salmon, deer or elk, roots, and berries, everyone again took a drink of water.[135]

Antone Minthorn, a Umatilla, explains:

> The importance of the first salmon ceremony has to do with the celebration of life, of the salmon as subsistence, meaning that the Indians depend upon the salmon for their living. And the an-

135. Columbia River Inter-Tribal Fish Commission, *A Salmon Ceremony* (visited Sept. 14, 1998) <http://www.critfc.org/text/CERMON.HTM>; *See also* HUNN ET AL., WITH JAMES SELAM AND FAMILY, *supra* note 126, at 153 ("[a] strong swimmer was chosen to swim out above the falls with the remains of the fish first caught, where he dove deep to deposit it in mid-river as an invitation to its fellows to come upriver also.").

> nual celebration is just that - it's an appreciation that the salmon are coming back. It is again the natural law; the cycle of life. It's the way things are and if there was no water, there would be no salmon, there would be no cycle, no food. And the Indian people respect it accordingly.[136]

Whether and in what condition the fish and the peoples survive, however, is now significantly affected by the actions of health and environmental agencies at the state and federal levels. The manner in which these agencies respond to evidence of contamination of the water in which salmon and other fish swim implicates the survival of both the fish and the cultures of these First Americans.

B. *Exposure Assessment for the Fish Ingestion Pathway*

Risk is a product of toxicity and exposure. For carcinogens, the "toxicity" portion of this equation is captured by a cancer potency factor ("CPF"), a value specific to each environmental contaminant. The "exposure" portion is comprised by several components. In order to determine human exposure via fish ingestion, risk assessors use some version of the following equation.[137]

$$\text{Exposure [mg contaminant/kg bodyweight/day]} = \frac{(\text{Conc})(\text{BFC})(\text{FCR})(\text{DF})(\text{ExpDur})}{(\text{ABW})(\text{AveTime})(\text{UCF1})(\text{UCF2})}$$

Where:

Conc	=	Concentration of contaminant in water (μg/l of water)
BCF	=	Bioconcentration Factor: ratio of contaminant concentration in fish tissue to concentration in water
FCR	=	Fish Consumption Rate (g/day)
DF	=	Diet Fraction: fraction of FCR obtained in regulated waters
Exp Dur	=	Exposure Duration (30 years)
ABW	=	Adult Human Bodyweight (70 kg)
Ave Time	=	Average Time (75 years) [carcinogens only]
UCF1	=	Unit Conversion Factor: 1000 μg/mg
UCF2	=	Unit Conversion Factor: 1000 g/l

Some of the components of the exposure portion of the risk equation warrant further explanation because of their impact on estimations of exposure to contaminants through the fish ingestion pathway.

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136. Columbia River Inter-Tribal Fish Commission, *The Importance of Salmon to the Tribes* (visited Sept. 14, 1998) <http://www.critfc.org.text/CERMON.HTM>.

137. This example is the exposure portion of the equation for determining surface water cleanup levels for carcinogens in the regulation implementing Washington's Model Toxics Control Act ("MTCA"). WASH. ADMIN. CODE § 173-340-730(3)(a)(iii)(B) (1999).

1. *Bioconcentration Factor.*

The bioconcentration factor ("BCF") is a ratio of the concentration of an environmental contaminant in fish tissue to the concentration of the contaminant in the ambient water in which the fish lives. Fish bioaccumulate many environmental contaminants, primarily in their fatty tissues. Accumulation in fatty tissue occurs because many contaminants are lipophilic, that is, they have a greater affinity for lipids than for water. The BCF is a chemical-specific value. For example, EPA employed a BCF of 5000 for 2,3,7,8, TCDD (dioxin) in setting and approving the water quality standards at issue in *Dioxin/Organochlorine Center v. Clarke* and *Natural Resource Defense Council v. EPA.*[138]

2. *Fish Consumption Rate.*

The fish consumption rate ("FCR") represents the amount of fish humans eat per unit time, often expressed in grams per day.[139] It is typically based on fish consumption studies, which are conducted by one of two methods: "creel" and "diet recall."[140] A creel study requires a shoreside researcher to weigh the fish and sometimes to identify species that a subject fisher has caught on a given day (hence the method's name for the basket in which some fishers keep the fish they have caught) and interview the subject regarding the percentage of the catch they keep and eat, the number of other individuals with whom they share their catch, and the frequency with which they fish at the site.[141] The creel method is a direct measure of the fish caught from the particular waters at

138. The Fourth Circuit upheld the EPA's approval of Maryland and Virginia's reliance on this EPA value for the BCF for dioxin, despite EPA's admission that "scientific literature and research has changed significantly since preparation of the 1984 dioxin criteria document [in which EPA selected its 5000 figure]": there was evidence in the record of more recent studies that place the BCF anywhere from 26,000 to 150,000; and a Virginia state-specific study that arrived at a BCF of 22,000. Natural Resource Defense Council v. EPA, 16 F.3d 1395, 1403 (4th Cir. 1993).

139. This expression requires that human body weight be standardized, and typically assumes a body weight of 70 kg. Alternatively, fish consumption may be expressed in grams/kg body weight/unit time, thereby accounting for variation in human body weight.

140. *See generally* OFFICE OF WATER, U.S. ENVTL PROTECTION AGENCY, CONSUMPTION SURVEYS FOR FISH AND SHELLFISH: A REVIEW AND ANALYSIS OF SURVEY METHODS (1992) [hereinafter EPA, CONSUMPTION SURVEYS FOR FISH]. Although the EPA enumerates five approaches to fish consumption studies, the first four ("Recall-Telephone Survey," "Recall-Mail Survey," "Recall-Personal Interview," and "Diary") might all be classified as "Diet Recall" methods, in that even keeping a diary of food consumed likely requires after-the-fact recollection. The fifth method enumerated by the EPA is the "Creel Census." *Id.* at 7-22.

141. *See id.* at 18-22.

which the researcher conducted the study, although it is an indirect measure of consumption.[142] A diet recall study, on the other hand, requires a subject to recall the quantity and sometimes species of fish consumed during some period,[143] and may also ask the subject to identify the source of the fish. Researchers typically aid subjects' estimation of quantity or portion size, e.g., by using plastic or foam models during personal interviews or by directing subjects to packaging information in the case of studies requiring diaries. The diet recall method is an indirect measure of fish consumption from any particular source;[144] however, it is a direct measure of fish consumed.[145]

EPA currently assumes a fish consumption rate of 6.5 grams/day.[146] This amounts to approximately one fish meal per month. The 6.5 grams/day value is derived from a diet recall study conducted in the mid-1970s of the general population of the United States, fish consumers and non-consumers alike.[147] Researchers from National Purchase Diary, Inc. used standardized questionnaires to conduct a market survey of 25,165 individuals about their consumption of marine, estuarine and freshwater fish.[148] The resulting data set was interpreted by Javitz, et al. in 1980, who arrived at an arithmetic mean consumption rate of 14.3 grams/day for fish consumers in the general population.[149] The EPA then corrected this number (1) to reinclude members of the general population who did not consume fish at all, and (2) to exclude marine species, arriving ultimately at a value of 6.5 grams/day.[150] This standard

142. *See id.* at 7, 18.

143. *See id.* at 8-18.

144. Subjects may, however, be asked to estimate the percentage of the fish they consume that comes from each of various sources. *Id.*

145. *See id.* at 7.

146. *See supra* note 37. Washington's Model Toxic Control Act currently assumes a fish consumption rate of 54 g/day. However, this number is halved by application of a 0.5 "diet fraction" a concept explained infra Part II.B.3. The result is that the MTCA effectively assumes a fish consumption rate of 23 g/day. *See* WASH. ADMIN. CODE § 173-340-730(3)(a)(iii)(B) (1999).

147. HAROLD JAVITZ, SRI INTERNATIONAL, SEAFOOD CONSUMPTION DATA ANALYSIS 18-34 (1980).

148. *Id.* at 18-20.

149. *Id.* at 29.

150. Missing and deleted data required considerable efforts to review the original data set on the part of the contractor that analyzed the data, the National Marine Fisheries Service, and the EPA. EPA ended up relying on the experience of a NMFS employee to reconstruct the missing data identifying the species consumed and classifying the species as marine, estuarine, or freshwater. An internal EPA memorandum recounts:

[A] rather large amount of the consumed fish and shellfish was listed as 'unclassi-

assumption is used by EPA when it sets health-based environmental standards. It is also employed by EPA in criteria documents and in other agency pronouncements designed to provide guidance to state health and environmental agencies. Finally, it informs EPA approval of state environmental standards.

3. *Diet Fraction.*

The diet fraction is a regulatory concept used to interpret fish consumption data. In theory, a diet fraction estimates the percentage of the FCR that comes from contaminated or regulated waters.[151] For example, if the study that produced the FCR used the diet recall method, results may include fish caught and consumed from waters of regulatory concern and also from other waters. The diet fraction distinguishes these two sources. If the diet fraction is 0.8, this represents the estimate that 80% of the fish consumed came from waters of regulatory concern and 20% from elsewhere.[152]

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fied' or 'species not reported' in the NPD survey. Ms. Betty M. Hackley of the National Marine Fisheries Service has worked with the survey data for years and she feels that most of the unclassified group consists of cod, pollock, and whiting (silver hake). Since all of these species would be considered marine, *this whole group was considered marine.*

Memorandum from Charles E. Stephan, Environmental Scientist, Environmental Research Laboratory—Duluth, U.S. Environmental Protection Agency to Dr. Jerry Stara, Director, Environmental Criteria & Assessment Office, U.S. Environmental Protection Agency 1 (July 3, 1980) (emphasis added). Notably, nowhere in the memorandum and referenced correspondence is any mention of an attempt by EPA to ascertain consumption rates of only "maximum residue fish," although EPA subsequently claimed in litigation that its "6.5 grams per day value is not intended to represent total fish consumption but, rather, that subset of fish containing the maximum residues of dioxin permissible under state law." National Resource Defense Council v. EPA, 16 F.3d 1395, 1403 (4th Cir. 1993).

151. *See, e.g.*, WASHINGTON STATE DEP'T OF ECOLOGY, RESPONSIVENESS SUMMARY ON THE AMENDMENTS TO THE MODEL TOXICS CONTROL ACT CLEANUP REGULATION: CHAPTER 173-340 WAC at 218 (1991) ("The 'fish diet fraction' . . . is the ratio of the weight of fish/shellfish tissue consumed from a contaminated source to the total weight of fish/shellfish tissue consumed.") [hereinafter MTCA RESPONSIVENESS SUMMARY].

152. Presumably, fish caught elsewhere are not of concern to the regulator for purposes of setting standards for the subject water, irrespective of whether "elsewhere" is also contaminated and thus a source of exposure. The use of a diet fraction is sometimes coupled with an FCR derived from a study using the creel method. Given that a creel study provides a direct measure of fish consumed from regulated waters, this coupling does not make sense. Application of a diet fraction or its equivalent in this situation operates simply to reduce the measure of fish consumed—the FCR. Washington's MTCA arguably makes this error, coupling a diet fraction of 0.5 with an FCR derived from the Pierce et al. study, a creel study. *See supra* note 151, at 216-19.

C. *Non-quantified Evidence of Fish Consumption*

Abundant evidence exists that American Indian subpopulations consume greater quantities of fish than the general population. For example, in 1990 the Yakama Indian Nation and the Columbia River Inter-Tribal Fish Commission attested before the Oregon Environmental Quality Commission to tribal members' heavy reliance on fish and attempted to draw attention to the connection between their fish consumption and the threat to their health posed by the pollution of Columbia River Basin fish by dioxin released into the waters from pulp and paper mills.[153] Patrick C. West noted in the EPA's own journal the "long and well documented fishing culture" of the Great Lakes tribes of the Bay Mills, Grand Traverse and Sault Ste. Marie bands of Chippewa, evidenced not least in the reservation of their right to fish by treaty in 1836. He also cited evidence of high consumption rates for subsistence fishers from small skiffs, for crew members in the commercial sector whose labor is often compensated in extra fish, and for off-reservation Indians in Michigan.[154] Leaders of the Mattaponi and Pamunkey tribes in Virginia told EPA regulators that their members "ate more fish than the 'one meal per month'" assumed to be the "average" by the Virginia DEQ when it set standards, approved by EPA, for dioxin contamination in state waters, including the waters traditionally fished by the Mattaponi and Pamunkey.[155] John Banks, Director of the Penobscot Nation Department of Natural Resources, recounted to the local press the heavy reliance of members of the Penobscot Nation on fish from the Penobscot River, stating that tribe members "traditionally eat two or three meals of fish a week."[156] Notably, this data has been brought to the attention of health and environmental agencies.[157]

Until quite recently, however, studies quantifying fish consumption of Native American subpopulations have been nonexistent. The lack of quantitative, as opposed to "anecdotal" or qualitative, evidence has meant that the higher fish consumption rates of these

153. *Dioxin: Yakimas Take a Stand Against Pollution*, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, Feb. 1990, at 2.

154. West, *supra* note 21, at 15.

155. Brief for Plaintiffs-Appellants at 24, Natural Resource Defense Council v. EPA, 16 F.3d 1395 (4th Cir. 1993) (No. 92-2520).

156. Gagnon, *supra* note 10 (attributed to John Banks, Penobscot Nation Department of Natural Resources).

157. *See, e.g.*, OFFICE OF THE ADMINISTRATOR, U.S. ENVTL. PROTECTION AGENCY, ENVIRONMENTAL RISK IN INDIAN COUNTRY 16 (1992).

subpopulations have gone unaccounted for. According to agency risk assessors, the risk assessment equation calls for a quantified, peer-reviewed expression of fish consumed.[158]

Studies quantifying fish consumption of the general population, on the other hand, have existed since the 1970s. Sometimes studies were undertaken to provide consumer data for fish-products marketing purposes, sometimes to provide human health data for regulatory or other public purposes. These studies currently form the basis for agency risk assessors' standard assumptions, even though, as EPA concedes, "early studies of fish consumption provided only limited data. Although the number of fish meals was tallied, socioeconomic or demographic questions were usually limited and . . . there was no effort to identify subsistence and recreational anglers obtaining their catches from polluted waters."[159] As discussed above, EPA used data from a marketing study of the general population to arrive at the 6.5 grams/day figure that has become the standard assumption for the fish consumption rate used by federal and state regulators for inland and coastal areas alike.

158. Qualitative data on this point are difficult to incorporate into the risk assessment equation, which requires quantified inputs. This, of course, is a problem with the use of quantitative risk assessment in the first place. *See, e.g.*, Kuehn, *supra* note 26, at 126-27. Obviously, the variable in the risk assessment equation requires a numerical value, in grams/day. To the extent that regulators have attempted to consider qualitative data alongside quantitative approaches, the qualitative data tend to get dwarfed by the "hard" numbers. This is likely an example of the operation of Gresham's law. *See, e.g.*, SHRADER-FRECHETTE, *supra* note 53, at 189-90 (1985).

159. EPA, CONSUMPTION SURVEYS FOR FISH, *supra* note 140, at 2. More recently, researchers have sought to quantify fish consumption for portions of the population more likely to consume greater quantities of fish. The target population for these studies, however, has mainly been "recreational anglers." Yet some of these studies have been sensitive to the fact that this group might include both those who fish for purely recreational reasons and those who fish for economic reasons. *See, e.g.*, M. LANDOLT, ET AL., POTENTIAL TOXICANT EXPOSURE AMONG CONSUMERS OF RECREATIONALLY CAUGHT FISH FROM URBAN EMBAYMENTS OF PUGET SOUND: FINAL REPORT 1, 5 (1987) (study targeting "recreational anglers" in Commencement and Elliott Bays of the Puget Sound, which included both shoreside anglers and anglers who fished from boats). Increasingly, however, some of these studies have included demographic data regarding the subjects, or have even targeted "minority" communities. *See generally, e.g.*, West, *supra* note 21. Note however, that these studies typically draw their list of subject participants from among fishers licensed by the relevant state fish and wildlife commission, and that Native Americans living on reservation or exercising treaty-secured fishing rights need not obtain fishing licenses from any state. *See, e.g.*, 2 EPA, EXPOSURE FACTORS HANDBOOK, FISH INGESTION FACTORS at tbl. 2-44. Further, diet recall studies may draw their list of subject participants from local telephone rolls, a practice which may function to exclude Native peoples. *See, e.g.*, Shawn L. Gerstenberger et al., *Concentrations of Blood and Hair Mercury and Serum PCBs in an Ojibwa Population that Consumes Great Lakes Region Fish*, 35 J. TOXICOLOGY: CLINICAL TOXICOLOGY 377 (1997) (noting that only 75 of the 217 potential study participants had telephones).

Most regulators have been reluctant to adjust standard assumptions about the FCR on the basis of "mere" anecdotal evidence, and courts have not required them to do so. Thus the Ninth Circuit in *Dioxin/Organochlorine Center v. Clarke*[160] noted that the only available evidence of the Native Americans' higher fish consumption rates was anecdotal, which EPA was free to ignore in setting the total maximum daily load ("TMDL") for dioxin in the waters of the Columbia River basin under the Clean Water Act.[161] The court therefore upheld EPA's recourse to its standard 6.5 grams/day fish consumption rate. EPA had acknowledged in its risk analysis document that "about 15,000" Native Americans (along with several hundred thousand Asian Americans and low-income individuals) "are much more likely to catch and consume fish that has been contaminated with dioxin from the effluent discharged from the [pulp and paper] mills than other populations in the area." The EPA had also acknowledged that these subpopulations consume "an average of between 100 and 150 grams of fish flesh each day over the course of the year."[162] Yet the EPA argued to the court that "no definitive study has established the quantity and variety of contaminated fish consumed by these subpopulations."[163]

On similar grounds, the Fourth Circuit, in *Natural Resources Defense Council v. EPA*,[164] rejected a challenge to EPA approval of Virginia's and Maryland's decisions to set water quality standards for dioxin assuming an average fish consumption rate of 6.5 grams/day. The Virginia standards regulated, among other sources, a major pulp and paper mill located just a few miles from the Mattaponi and Pamunkey Reservations. EPA approved the standards despite the fact that leaders of the Mattaponi and of the Pamunkey tribes had explained to the EPA that their members ate more fish than the "one meal per month" that is the equivalent of the EPA's 6.5 grams/day figure. In its brief to the court, EPA chided the NRDC for the NRDC's "misplaced" reliance on "oral statements."[165] EPA's brief dismissively referred to the tribal leaders' knowledge: "the beliefs of these individuals were not based on fish consump-

160. 57 F.3d 1517 (9th Cir. 1995).

161. *See id.* at 1524.

162. Opening Brief of Plaintiffs-Appellants at 10, Dioxin/Organochlorine Center v. Rasmussen, 57 F.3d 1517 (9th Cir. 1995) (Nos. 93-35973 & 93-36000).

163. *Dioxin/Organochlorine Center*, 57 F.3d at 1524.

164. 16 F.3d 1395 (4th Cir. 1993).

165. Brief for Appellees at 31, Natural Resource Defense Council v. EPA, 16 F.3d 1395 (4thCir. 1993) (No. 92-2520).

tion studies; . . . EPA found only anecdotal information, and no data."[166] The Fourth Circuit agreed. The court upheld EPA's approval of the Virginia and Maryland standards, stating that these state environmental agencies were free to ignore such "anecdotal evidence," which it deemed "speculative at best."[167]

In the wake of *Dioxin/Organochlorine Center* and *Natural Resource Defense Council v. EPA*, it seems clear that the only knowledge that agencies and courts will permit to count is that which is quantified, written down, and in accordance with scientific convention. The requirement that Native Americans translate their lived experience and community knowledge into a form that is recognized as "science" is itself an imposition of the dominant community's values, its judgments about ways of knowing.[168] Agencies' failure to accept this knowledge as valid, moreover, deprives agencies of much-needed information—data that have an ages-old scientific pedigree.

Given this reluctance on the part of agencies and courts, the practical necessity of quantifying what Native Americans know to be the case about their higher fish consumption relative to non-Indians is clear. Fish consumption studies, however, are both expensive and time consuming to conduct. In addition, a particular expertise in data collection and analysis is required if the study is to be received by the scientific and regulatory community[169]—an expertise that may or may not be readily at hand, either possessed by

166. *Id.* at 31 & n.27.

167. *Natural Resource Defense Council*, 16 F.3d at 1403.

168. Lloyd Burton and David Ruppert describe a similar instance in which Judge William Downes of the United States District Court in Wyoming required that Native knowledge be translated into the form that was acceptable by the dominant society's conventions, in order to be accepted and considered in a dispute over the meaning and use of a Lakota sacred site:

> In the trial court proceedings, Lakota elders approached the court clerk to ask if it might be possible for a few of the elders to speak about Devil's Tower and its meaning to them—in the courtroom, but in the absence of the adversarial question and answer format that the federal rules of civil procedure normally require. What they were asking for was a chance to speak about the Tower and its important cultural meanings for Indian peoples in ways that are appropriate to their own context. The court, apparently concerned that it not be perceived as overly accommodative of the wishes of tribal spiritual advisors (as plaintiffs were asserting the [National Park Service] had been), denied their request.

Lloyd Burton & David Ruppert, *Bear's Lodge or Devil's Tower? Inter-Cultural Relations, Legal Pluralism, and the Management of Sacred Sites on Public Land*, 8 CORNELL J.L. & PUB. POL'Y (forthcoming, 1999).

169. This is one aspect of the problem Eileen Gauna terms "expertise-ism." Gauna, *supra* note 102, at 31-36.

someone in the tribe or accessible to tribal governments or other interested groups of Native Americans.

Since the *Dioxin/Organochlorine Center v. Clarke* decision, some tribes of the Puget Sound and the Columbia River Basin have worked to buttress evidence of their relatively higher fish consumption rates with quantitative studies of the sort preferred by agencies and the courts.[170] These studies were undertaken in large part to address EPA's claim that it was free to ignore available evidence of Native Americans' fish consumption patterns because this evidence was anecdotal, orally transmitted, or non-quantified, and therefore speculative. These studies have been available now for several years. EPA, however, has only recently moved to revisit its 1980 water quality criteria—the source of its 6.5 grams/day fish consumption rate. In the latter half of 1998, EPA issued Draft Revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health ("Draft AWQC Revisions").[171]

Once finalized, the Draft AWQC Revisions will update EPA's standard fish consumption rate, along with other aspects of its current water quality criteria. Although EPA mentions, in the Technical Support Document that accompanies the Draft AWQC Revisions,[172] the Columbia River and Puget Sound studies, EPA does not appear to have given much credence to even this new, quantified data. In fact, the Draft AWQC Revisions repeat troubling aspects of current practice and introduce problematic approaches, including for example, the treatment of "subsistence fishers/minority anglers" as a single category for calculating de-

170. The CRITFC survey was undertaken in direct response to the agency standard at issue in *Dioxin/Organochlorine Center*. *See* COLUMBIA RIVER INTER-TRIBAL FISH COMM'N, TECHNICAL REPORT 94-3, A FISH CONSUMPTION SURVEY OF THE UMATILLA, NEZ PERCE, YAKAMA, AND WARM SPRINGS TRIBES OF THE COLUMBIA RIVER BASIN (Oct. 1994) [hereinafter CRITFC SURVEY]. Fortunately, in this instance, there was an existing inter-governmental body charged by its four member tribes with managing and protecting the fishery; CRITFC staff includes biologists, attorneys and other professionals. However, a similarly constituted fish commission may not exist for every tribe or group of tribes, and the experience of these four Columbia River Basin tribes cannot be taken to be representative of other tribes. Also, it should be noted that in this instance, there was EPA funding for the study. The study took some time: CRITFC entered into a Cooperative Agreement with EPA in 1990, conducted the survey during the fall and winter of 1991-92, and published the Technical Report summarizing the study results in October, 1994. *Id.*

171. Draft AWQC Revisions, *supra* note 38, at 43, 756.

172. *See* U.S. ENVTL. PROTECTION AGENCY, AMBIENT WATER QUALITY CRITERIA DERIVATION METHODOLOGY HUMAN HEALTH: TECHNICAL SUPPORT DOCUMENT FINAL DRAFT (EPA-822-B-98-005, 1998) [hereinafter EPA, TECHNICAL SUPPORT DOCUMENT].

fault fish consumption rates.[173] And, with the exception of Washington, states in the Pacific Northwest have done no better.[174] In the meantime, months and years pass in which environmental standards for water and sediments that support fish remain insufficiently protective of Native American subpopulations.

D. *Quantified Evidence of Fish Consumption: Puget Sound and the Columbia River Basin*

Various studies of fish consumption rates in Puget Sound and the Columbia River Basin reveal that identifiable subpopulations such as recreational anglers and Native Americans are more highly exposed than the general population. Of particular note, these data indicate marked differences among Native American subpopulations and the general population. The studies support "anecdotal" evidence that fish consumption rates for members of Native American subpopulations are *significantly* greater than comparable rates for the general population in Washington and in the United States. These studies also show that the fish consumption rates for Native American subpopulations in the Pacific Northwest are greater even than for other identifiable higher-consuming subpopulations, such as recreational anglers. The relevant studies are summarized in Table 1, and the text below, according to the target population of each study. Note that the results are not directly comparable because of design and other differences among the studies. For example, studies may or may not have included anadromous fish or shellfish; or studies may have defined differently marine, estuarine, and freshwater species. Nonetheless, the numbers below afford a sense of the variability.

1. *Native Americans.*

Toy et al. study. According to a 1995 diet recall study conducted by and of the Tulalip and Squaxin Island tribes, the 50th percentile or median fish consumption rate for tribal members is between 35.6 and 48.7 grams per day; the arithmetic mean is between 60.6 and 82.9 per day; the 90th percentile is between 159.7

173. *See* discussion *infra* notes 191-94 and accompanying text.

174. The Washington State Department of Ecology, at least, is well along in the process of revisiting its standard assumptions regarding fish consumption in light of the studies produced by the Puget Sound and Columbia River Basin tribes. *See generally* LESLIE KEILL & LON KISSINGER, WASHINGTON STATE DEP'T OF ECOLOGY, ANALYSIS AND SELECTION OF FISH CONSUMPTION RATES FOR WASHINGTON STATE RISK ASSESSMENTS AND RISK-BASED STANDARDS (Draft 1999).

TABLE 1: QUANTIFIED EVIDENCE OF FISH CONSUMPTION

Study Authors (Date)	Sample Population	50th Percentile (g/day)	Mean (g/day)	90th Percentile (g/day)	95th Percentile (g/day)	Max. Value (g/day)	Study Method
Toy et al. (1995)	Squaxin Island and Tulalip tribes	35.6 – 48.7	60.6 – 82.9	159.7 – 221.7	205.1 – 280.5	391.4	Diet Recall (survey/ personal interview)
CRITFC (1994)	Nez Perce, Umatilla Yakama, and Warm Springs tribes	29.0 – 32.0	58.7	97.2 – 130.0	170.0	972.0	Diet Recall (survey/ personal interview)
Pierce et al. (1988)	Commencement Bay recreational anglers	23	—	54	—	—	Creel
Landolt et al. (1985)	Elliot, Everett, Sinclair Inlet, and Commencement Bay recreational anglers	12.3	—	—	95.1	—	Creel
Javitz (1980)	Fish consumers in United States	—	14.3	—	41.7	—	Diet Recall (survey/ diary)

and 221.7 grams per day; the 95th percentile is between 205.1 and 280.5 grams per day; and the maximum FCR is 391.4 grams per day.[175]

Columbia River Inter-Tribal Fish Commission ("CRITFC") study. According to a 1994 diet recall study conducted by and of the Nez Perce, Umatilla, Yakama, and Warm Springs tribes fishing along the Columbia River, the 50th percentile or median fish consumption rate for tribal members is between 29 and 32 grams per day; the arithmetic mean is 58.7 grams per day; the 90th percentile is between 97.2 and 130 grams per day; the 95th percentile is 170

175. *See* TOY ET AL., *supra* note 27, at 19, tbl. 2 & tbl. A2.

grams per day; and the 99th percentile is 389 grams per day.[176] The maximum consumption rate is 972 grams per day.[177]

2. *Recreational Anglers.*

Pierce et al. study. According to a 1981 creel study conducted by the Tacoma-Pierce County Health Department of recreational anglers in Commencement Bay of the Puget Sound, the 50th percentile or median fish consumption rate for these individuals is 23 grams/day; and the 90th percentile is 54 grams/day.[178]

Landolt et al. study. According to a 1987 creel study conducted by the National Oceanic and Atmospheric Administration ("NOAA") and the University of Washington of shoreside recreational anglers in Elliot, Commencement, Everett, and Sinclair Inlet Bays of the Puget Sound, the 50th percentile or median fish consumption rate for these individuals is 12.3 grams per day; and the 95th percentile is 95.1 grams per day.[179]

3. *General Population.*

Javitz study. According to the 1980 analysis of the mid-1970s diet recall study conducted by NPD Research, Inc. of fish consumers in the general population of the United States, the arithmetic mean fish consumption rate for these individuals is 14.3 grams/day and the 95th percentile is 41.7 grams/day.[180]

Two features of these subpopulation data, both of which fall under the heading of "variability," raise important issues for environmental standard-setting. First, fish consumption rates vary considerably among subpopulations within a general population. For example, fish consumption rates for the Puget Sound Native subpopulation, as evidenced by the Toy et al. study, are greater than the recreational angler subpopulation, as evidenced by the Pierce et al. study, at every point of comparison.

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176. *See* CRITFC SURVEY, *supra* note 171, at 3.

177. CRITFC Comments, *supra* note 1, at 8.

178. *See* DOUG PIERCE ET AL., TACOMA-PIERCE COUNTY HEALTH DEP'T, COMMENCEMENT BAY SEAFOOD CONSUMPTION STUDY: PRELIMINARY REPORT (1981); MTCA RESPONSIVENESS SUMMARY, *supra* note 151, at 217.

179. *See* LANDOLT ET AL., *supra* note 159; WASHINGTON STATE DEP'T OF HEALTH, TIER I REPORT, DEVELOPMENT OF SEDIMENT QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH, D-512 (1995) (citing U.S. ENVIRONMENTAL PROTECTION AGENCY, HEALTH RISK ASSESSMENT OF CHEMICAL CONTAMINATION IN PUGET SOUND SEAFOOD (1988)).

180. *See* HAROLD JAVITZ, SRI INTERNATIONAL, SEAFOOD CONSUMPTION DATA ANALYSIS 18-34 (1980).

Of particular note is the difference between the fish consumption rates currently employed in various regulatory contexts and the fish consumption rates for Native Americans evidenced by the Toy et al. and CRITFC studies. Compare the EPA's standard assumption of 6.5 grams per day, a number based on the mean value from the Javitz study, (corrected to exclude marine species, and adjusted to include fish non-consumers) with the arithmetic mean from Toy et al., at between 60.6 and 82.9 grams per day and with the arithmetic mean from CRITFC, at 58.7 grams per day. Similarly, the Washington State Department of Ecology's MTCA regulation uses a standard assumption of 54.0 grams per day, a number based on the 90th percentile value from Pierce, et al. Compare the 90th percentile value from Toy et al., at between 159.7 and 221.7 grams per day, and the 90th percentile value from CRITFC, at between 97.2 and 130 grams per day.

Second, fish consumption rates within a subpopulation may also vary considerably. In the non-standard distribution that characterizes the Puget Sound tribal subpopulation, for example, individuals at the median consume between 35.6 and 48.7 grams per day, while individuals at the 95th percentile consume between 205.1 and 280.5 grams per day—roughly five times the median. The maximum value for this subpopulation, 391.4 grams per day, is an order of magnitude greater than the median value. Although only a small percentage of the subpopulation comprises the upper tail of this distribution, the individuals consuming at these values are ingesting relatively large amounts of fish each day. Compare this skewed distribution relative to the uniform distribution assumed by risk assessors in the absence of data showing individuals in the upper tails: a single point such as an average or median value no longer approximates the values at the extremes of the distribution.

These observations about the fish consumption data—variability is large and the distribution is skewed—have implications for current risk assessment practice. Part IV fleshes out current responses to this data in the agencies and courts. Part V then critiques current practice.

IV. Current Practice in the Agencies and Courts

As pointed out in the preceding Part, until very recently agencies have been indifferent to or have misunderstood Native American fish consumption practices. Although EPA conceded in early

documents that it was aware of higher-consuming subpopulations, especially Native American or other subsistence fishers, EPA and other agencies did not undertake or support efforts to gather data to quantify this consumption. Yet, the agencies and courts involved in the disputes in *Dioxin/Organochlorine Center v. Clarke* and *Natural Resource Defense Council v. EPA* maintained that quantification was necessary and were unwilling to hear the qualitative information brought to their attention by Native Americans. A second, related aspect of agencies' and courts' current practice is also deeply troubling: agencies have argued that it is appropriate to set standards that provide an acceptable level of protection to the general population, but some lower level of protection to Native American subpopulations. This issue will be discussed in Part IV.A, below. Third, although the EPA's Draft AWQC Revisions improve upon earlier assessments of fish consumption rates, EPA nonetheless makes numerous judgments that individually and collectively work to discount the actual exposure circumstances of Native American subpopulations. This issue will be discussed in Part IV.B. Finally, *Dioxin/Organochlorine Center v. Clark's* misunderstanding of uncertainty and variability threatens to impede thoughtful analysis of agency responses to the variability that has been demonstrated to characterize fish consumption rates where Native Americans of the Pacific Northwest are among those affected by agency risk assessments. This issue will be taken up in Part IV.C.

In scrutinizing current agency practice, one must understand the backdrop against which agencies consciously operate. Agencies' determinations about how much risk is "acceptable," or about who and how many merit protection are not made in a vacuum, but in the context of other pressures and priorities. The decisions and judgments described in this Part reflect agencies' efforts to balance the legitimate claims of the affected Native American subpopulations against considerations of cost, administrability, and political feasibility. While I will argue in Part IV that agencies' current balancing efforts run afoul of legal obligations and relevant normative commitments, it is nonetheless useful to recognize that agencies have arrived at the decisions in an effort to accommodate these multiple considerations.

A. *"Lower Yet Adequate" Protection for Higher-Consuming Native American Subpopulations*

In *Dioxin/Organochlorine Center*, the EPA employed its default as-

sumption for the FCR, 6.5 g/day. Relying on this standard assumption about exposure, EPA derived a water quality standard, the TMDL for dioxin, by solving the risk equation for concentration with cancer risk held at $1(10^{-6})$. If a particular environmental standard is set, assuming the exposure of the "average American," to result in risk of no more than 1 in 1,000,000, that same standard *will* result in greater risk to a more highly exposed subpopulation. In *Dioxin/Organochlorine Center*, this greater risk was estimated to be 23 in 1,000,000 or 2.3 in 100,000.[181]

The Ninth Circuit accepted the EPA's choice of an FCR of 6.5 g/day by asserting that the resulting standards would provide "lower yet adequate" protection to higher-consuming Native American subpopulations. Citing *Ohio v. EPA*,[182] the court held that even if these subpopulations consume 150 g/day of fish and would therefore be subject to excess risk of $2.3(10^{-5})$, "[t]his level of risk protection is within levels historically approved by the EPA and upheld by courts."[183] The court endorsed EPA's argument that "the one-in-a-million risk level mandated by the state water quality standards for the general population does not necessarily reflect state legislative intent to provide the highest level of protection for all subpopulations but could reasonably be construed to allow for *lower yet adequate* protection for specific subpopulations."[184]

The court's argument relied on two questionable premises. First, it invoked *Ohio v. EPA*'s controversial view that a risk level deemed acceptable in one regulatory context is appropriate in every other regulatory context. Evidence suggests, however, that a host of considerations contribute to people's views about risk, and that people may be willing to accept differing levels of risk in different contexts. Second, and most egregious, the court accepted the EPA's argument that, so long as a subpopulation's risk level falls within the range generated by *Ohio v. EPA*, it is "adequate" and there is no harm even from the systematic provision of "lower yet adequate" protection to "specific subpopulations," even where the

181. Note that it is not the case that everybody in the general population has an equal chance of being subject to risk that now ranges from 1 in 1,000,000 to 2.3 in 100,000. It should be characterized this way only if the identity of the individuals at various points on the distribution were unknown and unknowable, a point to which I return *infra* Part V. Rather, members of the general population will be subject to a risk level of 1 in 1,000,000, while members of the particular subpopulation will be subject to the greater risk level of 2.3 in 100,000.

182. 997 F.2d 1520, 1533 (D.C. Cir. 1993).

183. Dioxin/Organochlorine Center v. Clarke, 57 F.3d 1517, 1524 (9th Cir. 1995).

184. *Id.* (emphasis added).

specific subpopulation harmed is Native American. The court was apparently untroubled by the discriminatory effect of its holding. I criticize more fully this second aspect of agencies' and courts' current approach in Part IV.C.

The Ninth Circuit also accepted the EPA argument that it was reasonable to assume that only some of the fish eaten by higher-consuming subpopulations is fully contaminated whereas all of the fish eaten by the lower-consuming general population is fully contaminated. Thus, the court claimed, "the EPA estimated that the total consumption of 150 grams of fish by these subpopulations would lead to no greater dioxin ingestion than would occur by consuming 6.5 grams of fully contaminated fish. On this assumption the subpopulations would be adequately protected."[185] In support of its assumption, the EPA pointed to "uncertainties" arising from the absence of definitive studies "establish[ing] the quantity and variety of fish consumed by these subpopulations," and to the fact that many fish in the Columbia River Basin are anadromous, and thus spend only some of their lifecycle in contaminated river waters. Note that EPA did not itself take any of the existing definitive studies regarding the contaminant loading of anadromous fish into account, and ignored evidence that anadromous fish in fact take up and bioaccumulate significant chemical contaminants during their residency in estuaries.[186] Further, the intimation that EPA derived its 6.5 grams/day FCR as a result of a careful and purposeful attempt to record consumption of only that quantity of fish that is "fully contaminated" is insupportable, given the guesswork revealed to have surrounded the crafting of the 6.5grams/day number.[187]

B. *EPA's Draft Water Quality Criteria Methodology Revisions*

EPA has recently issued Draft Revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health ("Draft AWQC Revisions"). The Draft AWQC Revi-

185. *Dioxin/Organochlorine Center*, 57 F.3d at 1524.

186. *See generally, e.g.*, B.B. McCain et al., *Uptake of Aromatic and Chlorinated Hydrocarbons by Juvenile Chinook Salmon (Oncorhynchus tshawytcha) in an Urban Estuary*, 19 ARCHIVES OF ENVTL. CONTAMINATION & TOXICOLOGY 10 (1990).

187. *See supra* note 150 and accompanying text. The Fourth Circuit relies on a similar argument, and intimates that EPA carefully and purposefully determined that 6.5 grams/day reflects not total fish consumption, but instead the subset of fish consumed containing the "maximum residue" of contaminants. Natural Resources Defense Council v. EPA, 16 F.3d 1395, 1403 (4th Cir. 1993).

sions will replace various aspects of EPA's current water quality criteria, which were developed in 1980, and are the source of EPA's 6.5 grams/day fish consumption rate.[188] EPA's proposed changes to its criteria are limited to two important components of the exposure portion of the risk assessment equation, the fish consumption rate and the bioconcentration factor (which will be replaced by a bioaccumulation factor or BAF). EPA also proposes to change its approach to acceptable risk. For present purposes, I will focus on the proposed changes to the FCR and acceptable risk.

1. *Proposed changes to the fish consumption rate.*

EPA proposes a new default fish consumption rate of 17.80 grams/day. This value is the 90th percentile value for consumption of freshwater and estuarine fish by the general population (fish consumers and fish nonconsumers).[189] It is derived from a diet recall study conducted by the United States Department of Agriculture, the Continuing Survey of Food Intake by Individuals ("CSFII") for the years 1989, 1990, and 1991.[190] EPA also proposes a new default fish consumption rate of 86.30 grams/day for "subsistence fishers/minority anglers."[191] This value is the 99th percentile value for consumption of freshwater and estuarine fish by the general population (fish consumers and fish nonconsumers), also derived from the USDA's CSFII for the years 1989, 1990, and 1991. According to the EPA, this value "is within the range of average intakes for subsistence fishers/minority anglers."[192] EPA adds, however, that it seeks comments "on alternatively using 39.04

188. EPA is required periodically to revise its water quality criteria to ensure they are "accurately reflecting the latest scientific knowledge . . . on the kind and extent of all identifiable effects on health and welfare . . . which may be expected from the presence of pollutants in any body of water . . . ." 33 U.S.C. § 1314(a)(1) (1994).

189. The EPA notes that this value also "approximates the average consumption rate for sport anglers, nationally." Draft AWQC Revisions, *supra* note 38, at 43,762.

190. The CSFII study was conducted annually over a three-day period. During this period, participants were asked to quantify and categorize all food intake according to a list of approximately 6,600 different food codes, of which 460 relate to fish or shellfish. The individual consumption data was then matched with standard recipes contained in a USDA recipe file, in order to adjust the reported quantities of food consumed to reflect the fish component. For example, if a participant entered food code 27450551 for tuna casserole, the USDA recipe file assumes that the prepared fish accounts for 34.12% of the recipe; reported consumption rates are adjusted accordingly. 1 & 2 U.S. DEP'T OF AGRICULTURE, CONTINUING SURVEY OF FOOD INTAKE BY INDIVIDUALS at tbl. A-2 (1998) [hereinafter 1 CSFII STUDY & 2 CSFII STUDY].

191. Draft AWQC Revisions, *supra* note 38, at 43,762.

192. *Id.*

grams/day for subsistence fishers/minority anglers, which is lower in the range of averages."[193] Significantly, EPA proposes to treat together what it terms "subsistence fishers/minority anglers." Although EPA nowhere makes clear precisely who it views to be included in this grouping or to which studies it refers for the "range of averages," it would appear that EPA's category includes various Native Americans, Asian-Americans, low-income individuals, and other individuals who simply eat a lot of fish.[194]

Several features of the CSFII study and EPA's use of this data merit elaboration. First, the CSFII study allocated fish species by habitat, and then generated fish consumption rates for three separate categories: freshwater/estuarine, marine, and all fish. EPA's Draft AWQC Revisions chose to base the defaults and recommendations on the freshwater/estuarine fish only, thereby excluding species deemed marine. Notably, EPA deemed salmon to be marine, although they are anadromous, and thus spend a portion of their lifecycles in marine environments and a portion in freshwater and/or estuarine environments. Salmon consumption is thus not counted in EPA's proposed estimates of fish consumption. EPA estimates that this exclusion has the effect of decreasing the

193. *Id.*

194. EPA, Technical Support Document, *supra* note 172, at 85-123. According to the notes to Tables 2.3.9 and 2.3.10, entitled respectively "Subsistence Fishers Consumption Data," and "Subsistence Fishers Survey Methods," "[s]ubsistence fishers include groups (such as Florida residents receiving food stamps) that may eat sport-caught fish at high rate but do not subsist on fish as a large part of their diet." *Id.* at 101-02. Listed fisher groups are: Great Lakes tribes, Columbia River tribes, Florida residents receiving food stamps, Florida Asian residents, High-end Caucasian consumers on Lake Michigan, Wisconsin tribes, Chippewa tribes in Wisconsin, and Native Alaskan Adults. *Id.* at 101. The notes indicate that the fisher groups in the tables correspond to those of the same heading appearing in the textual account of fish consumption study data. The textual account, however, does not neatly track the tables: some fisher groups, such as "Tribes of Puget Sound," that are listed in the text under EPA's category "Subsistence Fishers" are not included in Tables 2.3.9 and 2.3.10; and some fisher groups, such as "Florida residents receiving food stamps" are included in Tables 2.3.9 and 2.3.10, but are listed in the text under EPA's category "Sportfishers." Finally, in introductory remarks, EPA distinguishes two groups, sportfishers and subsistence fishers. *Id.* at 85-86. Subsistence fishers eat more fish than the general population, yet are not recreational fishers; they "may rely on catching and eating fish in order to meet nutritional needs or because of cultural traditions." *Id.* at 86.

> Subsistence fishers are often (although not always) low income individuals and may reside in either urban or rural areas. Several ethnic groups have been identified as having members who subsist on fish. Several specific groups of Native American fishers have been identified in the Northwest and the Great Lakes Region. Asian-American fishers are a group that includes numerous populations such as Laotian, Hmong, Cambodian, and Vietnamese, each with differing consumption patterns and cultural traditions.

Id. (citations omitted).

resulting FCR by thirteen percent.[195]

Second, the CSFII study generated two further sets of fish consumption rates: those representing the entire population—fish consumers and fish nonconsumers alike—and those representing fish consumers in the population. EPA's defaults are based on the first set of values, that is to say, per capita fish consumption rates. The per capita rates were based on surveys (conducted over three years) of a total of 11,912 individuals. The CSFII study also generated fish consumption rates for what it termed "acute consumers," i.e., individuals who actually ate fish during the three-day study period each year. Of the 11,912 participants, 3,927 ate fish during the study period and so were termed "acute consumers."[196] Note that these figures mean that for almost 8,000 participants, daily average fish consumption rates registered as "zero." The per capita fish consumption rates were necessarily affected by the presence of so many zero values. As EPA itself cautions states and tribes, "when considering median values from fish consumption studies, States and Tribes need to ensure that the distribution is based on survey respondents who reported consuming fish *because surveys based on both consumers and nonconsumers typically result in median values of zero.*"[197] In fact, the inclusion of fish nonconsumers will have the effect of decreasing the point estimates for all but the maximum value. Compare, for example, the following sets of point estimates in Table 2.

TABLE 2: FISH CONSUMPTION VALUES BY INCLUDED POPULATION

Included Population	50th Percentile (g/day)	Arithmetic Mean (g/day)	90th Percentile (g/day)	95th Percentile (g/day)	99th Percentile (g/day)
Per Capita[198]	0.00	18.01	60.65	86.25	142.96
"Acute Consumers"[199]	85.36	106.39	206.76	258.22	399.26

195. Draft AWQC Revisions, *supra* note 38, at 43,804.

196. These figures are derived from 1 CFSII STUDY, *supra* note 190, at IV-8 and IV-16 (tlbs. A-3 & B-3). Note that 8478 of the 11,912 participants were 18 years of age and older.

197. Draft AWQC Revisions, *supra* note 38, at 43,802.

198. 2 CFSII Study, *supra* note 190, at IV-9 (tbl. A-4). These values are for all fish, "as consumed." Recall that EPA's default is based not on all fish but only freshwater and estuarine fish, for which the values are: mean = 5.59 g/day; 50th percentile = 0.00 g/day; 90th percentile = 17.80 g/day; 95th percentile = 39.04 g/day; and 99th percentile = 86.30 g/day. *Id.*

199. *Id.* at IV-17 (tbl. B-4). These values are for all fish, "as consumed."

At every point of comparison, the choice of per capita figures is the choice of a relatively lower value for the FCR.

Third, the CSFII study made still another cut, generating two sets of fish consumption estimates, those using uncooked fish tissue weights and those using "as consumed"(and usually) cooked fish tissue weights. EPA's Draft AWQC Revisions opt for the "as consumed" numbers. As EPA acknowledges, the uncooked weight values generally exceed the cooked weight values by about 20%; "[t]his obviously means that using cooked weights results in a slightly lower intake rate and slightly less stringent AWQC."[200] In fact, according to the CSFII numbers, while this choice affects the mean or median value, it has a greater effect at the high end of the distribution. Compare, for example, the following values.

TABLE 3: FISH CONSUMPTION VALUES BY ASSUMPTIONS ABOUT COOKING

Assumption About Cooking	50th Percentile (g/day)	Arithmetic Mean (g/day)	95th Percentile (g/day)	99th Percentile (g/day)
"As Consumed"[201] (usually cooked)	0	5.59	39.04	86.30
Uncooked[202]	0	7.09	49.83	111.13

Finally, participants in the CSFII study were selected from the forty-eight contiguous states only. The authors of the study note the potential for bias toward underestimation of per capita consumption in that Alaska and Hawaii "could potentially contain a larger percentage of subsistence fisherman [sic] and fish eaters than the population from the 48 conterminous states . . . ."[203]

The Draft AWQC Revisions establish a hierarchy of preferences that urges the use of local data and offers the default values as a last resort. EPA states that it chose the default values to protect the majority of individuals within the relevant groups. EPA notes that "States and Tribes are urged to use a fish intake level derived from local data on fish consumption in place of these default values when deriving AWQC, ensuring that the fish intake level chosen be

200. Draft AWQC Revisions, *supra* note 38, at 43,803.

201. 2 CFSII STUDY, *supra* note 190, at IV-9 (tbl. A-4). These values are for per capita consumption of freshwater and estuarine fish.

202. 1 CFSII STUDY, *supra* note 190, at IV-9 (tbl. A-4). These values are for per capita consumption of freshwater and estuarine fish.

203. 2 CSFII STUDY, *supra* note 190, at ix.

protective of highly exposed individuals in the population."[204] To this end, EPA suggests a four-part hierarchy of preferences: "(1) use of local data; (2) use of data reflecting similar geography/population groups; (3) use of data from national surveys; and (4) use of proposed default intake rates."[205] Inasmuch as it indicates a preference for local data, this aspect of the Draft AWQC Revisions is a marked improvement. It goes well beyond mere willingness to consider local practices or thin admonitions that states and tribes "may wish" to account for the fact that the default values likely underestimate some subpopulations' consumption.

To the extent that states or tribes undertake any of the first three options, however, they must demonstrate "consistency with the principles" of the guidance provided by EPA's Draft AWQC Revisions in order to satisfy EPA review under CWA 303(c).[206] Thus, were a state or tribe to use local data, the choices undergirding EPA's default values would become recommendations for the state or tribe as it generated its local fish consumption rates. For example, EPA "recommends" that fish consumption rates be based on consumption of fresh and estuarine species only (although "[c]oastal States and Tribes that believe accounting for total fish consumption (i.e., fresh/estuarine and marine species) is more appropriate for protecting the population of concern may do so, provided that the marine intake component is not double-counted."),[207] and that fish consumption rates be based on cooked weight values rather than uncooked weight values.[208] Moreover, in current practice, many states—whether coastal or inland—rely on the default values generated by EPA.[209] This practice continues despite EPA having recognized in 1980, as in 1998, that the default values likely underestimate consumption of some subpopulations and despite EPA having urged states to develop values more reflective of local consumption.[210] And, of course, the default values are

204. Draft AWQC Revisions, *supra* note 38, at 43,803.

205. *Id.* at 43,802.

206. *Id.*

207. *Id.*

208. *Id.*

209. Telephone Interview with Denis Borum, Environmental Scientist, Office of Science and Technology, Office of Water, United States Environmental Protection Agency (Nov. 23, 1999).

210. Even if states would otherwise be willing to undertake the costs and time involved to gather local data or review data presented by relevant subpopulations, states are aware of the reality that the EPA approval process will go more smoothly if they use EPA defaults and data. *See* Draft AWQC Revisions, *supra* note 38, at 43,763.

and will be used by EPA itself when it steps into the shoes of states that have declined to issue water quality standards, as happened in the case of the standards for Washington, Oregon, and Idaho at issue in *Dioxin/Organochlorine Center v. Clarke*.[211]

2. *Proposed approach to acceptable risk levels.*

In addition to the proposed changes to the default fish consumption rate, EPA proposes a new approach to acceptable risk levels. EPA begins by noting that it had emphasized in its 1980 AWQC Guidelines that:

> the maximum protection of human health from the potential carcinogenic effects due to exposure of Chemical X through the ingestion of contaminated water and aquatic organisms, the ambient water concentration should be zero based on the non-threshold assumption for this chemical. However, zero may not be attainable at the present time. Therefore, the levels which may result in incremental cancer risk over the lifetime are estimated at $1(10^{-5})$, $1(10^{-6})$, and $1(10^{-7})$.[212]

In its discussion of the current proposal, EPA does not explicitly endorse retention of the goal of zero contamination.[213] Instead, EPA recommends a range for risk level from $1(10^{-5})$ to $1(10^{-6})$ for the general population. While EPA adds that states and tribes are free to choose a more protective level, such as $1(10^{-7})$, it urges, "[c]are should be taken however, in situations where the AWQC includes fish intake levels based on the general population to ensure that the risk to more highly exposed subgroups (sportfishers or subsistence fishers) does not exceed the $1(10^{-4})$ level."[214] Thus, EPA's Draft AWQC Revisions introduces two tiers of permissible risk levels. While risk levels as protective as $1(10^{-6})$ (and even $1(10^{-7})$) are to be secured to members of the general population, risk levels as great as $1(10^{-4})$ are permissible for members of more highly exposed subpopulations, including subsistence fishers. This approach echoes that urged by EPA and accepted by the Ninth Circuit in *Dioxin/Organochlorine Center v. Clarke*. Presumably, EPA is

211. *See id.* ("The Agency intends to use these default factors to calculate water quality criteria when promulgating water quality standards for a State or Tribe under Section 303(c) of the [Clean Water] Act.").

212. Draft AWQC Revisions, *supra* note 38, at 43,763. Interestingly, EPA states that this "risk range was presented for information purposes and did not represent an Agency judgment on 'acceptable' risk level." *Id.*

213. Indeed, indications elsewhere in the Draft may point in the other direction, suggesting that EPA has abandoned this goal. *See* CRITFC Comments, *supra* note 1, at 11.

214. Draft AWQC Revisions, *supra* note 38, at 43,762.

willing to countenance "lower yet adequate" protection to "some subpopulations," including subsistence fishers, as a matter of course.

The preceding Parts have focused on aspects of agencies' present approaches that are of pressing concern because EPA also proposes to instate them in its forthcoming water quality criteria document. In sum, EPA proposes to define "acceptable" risk levels according to the subpopulation affected (with "lower yet adequate" protection acceptable for Native Americans), and to make a host of judgments that work to underestimate the fish consumption rates of Native American subpopulations. In this next Part, I describe recent work by EPA and the Ninth Circuit that has not appeared explicitly in agency proposals, but that retains the potential to misinform debate. I begin by canvassing agencies' repertoire of responses to variability.

C. *Agency and Court Responses to Uncertainty and Variability*

As noted above, when risk assessors in health and environmental agencies select a single value for a parameter that is characterized by uncertainty or for a parameter that is variable, their resulting assessment of risk will be inaccurate in some measure. The nature of the error, however, is quite different in cases of uncertainty and cases of variability. So considerations that should inform regulatory responses to uncertainty differ from those that should inform responses to variability.

Uncertainty marks so many of the inputs to a calculation of risk from environmental contaminants that agency responses to uncertainty are familiar and have been the subject of considerable debate. Instances of interindividual variability in exposure or susceptibility, on the other hand, have less often been acknowledged, and appropriate responses to variability have seldom explicitly been discussed.[215] Unfortunately, agencies and courts may have hindered understanding by failing themselves to speak with clarity about each and, sometimes, by failing to distinguish the two.

1. *Different considerations inform agency responses to uncertainty and variability.*

The issues raised by uncertainty and variability are different in

215. *See* Adam Finkel, *The Case for "Plausible Conservatism," in* SCIENCE AND JUDGMENT, *supra* note 43, at 604-05 (observing that the public has not yet clearly expressed its views about "how much protection to extend to the extremes of variable distributions.").

kind. The regulatory responses to uncertainty and variability have different purposes and produce different results, despite the fact that, as Adam Finkel explains, "the same terms and mathematical procedures are used to deal with each and . . . they may at times be hard to separate operationally."[216]

In instances of uncertainty, where agencies lack knowledge of the true value of some parameter necessary to predict risk, the choice of any value for that parameter will be in error. A conservative response reflects a choice between errors: it is better to overestimate risk than to underestimate risk. This approach is a familiar response in private as well as public decision making, and is captured in common aphorisms, for example, "it is best to err on the side of caution," and "better safe than sorry." A non-conservative response chooses the opposite error. The debate about appropriate responses to uncertainty continues.[217]

In instances of variability, on the other hand, agencies know[218] that there is a range of actual values for some parameter necessary to predict risk. An agency response does not require a conservative or non-conservative choice among errors: the values are not uncertain; they simply vary. In cases of interindividual variability, where agencies are aware of differences among individual exposures or susceptibilities, the response chosen instead reflects a determination about who merits protection. Should we seek to protect individuals at the median of the distribution that describes the variability? Individuals at the 90th percentile? The maximally exposed individual? Although some use the term "conservative" to describe a possible response to variability—one that determines that everyone or nearly everyone merits protection—such usage may engender confusion. For clarity, I will use the word "conservative" only in connection with responses to uncertainty;[219] I will discuss responses to variability as they affect the determination of

216. *Id.* at 604.

217. One recent suggestion, for example, attempts to address criticisms that current responses are overly conservative: Adam Finkel advocates employing a "plausibly conservative" default assumption for the parameter in question but permitting individuals—virtually always risk producers—to require agencies to revisit the assumption upon demonstrating that the default is in fact in error. *Id.* at 606-13. In addition to making the judgment that, in the absence of complete information it is better to make the error of overprotection rather than underprotection, such a strategy provides incentives for risk producers in particular to gather information about the uncertain parameter in question.

218. This assumes that there is no uncertainty *about* the variability.

219. *See, e.g., id.* at 603 ("Conservatism is a specific response to uncertainty that favors one type of error (overestimation) over its converse, but . . . the fact that it admits that

which individuals or subpopulations of individuals merit protection.

Agencies have employed four general strategies to address variability surrounding the inputs to the risk assessment equation. The first common response to variability has been not to acknowledge it and thus to assume that the only value one has is representative and thus captures the distribution.[220] A second common strategy—using an arithmetic mean or median value for a quantity that varies—looks like the first but proceeds instead from a deliberate decision that a mean or median value can be estimated reliably in light of the variability and is a good surrogate for the variable quantity.[221] Health and environmental agencies' standard assumption with respect to body weight, i.e., that every human weighs 70 kg, is a likely example.[222] A third regulatory strategy acknowledges the variability and then chooses a maximum or minimum value of a quantity that varies.[223] Risk assessors sometimes attempt to register maximum human exposure by focusing on one spatial scenario for exposure (e.g., the "fenceline" of a source of air pollution or the location where the most-exposed individual resides) or one subpopulation (e.g., exercising adults or children who ingest pathologically large amounts of soil).[224] In so doing, risk assessors sometimes seek to protect the most susceptible members of the

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either type of error is possible is more important than the precise calculus it may use to balance those errors.").

220. *See, e.g.*, SCIENCE AND JUDGMENT, *supra* note 43, at 195. The NRC has termed this strategy "[i]gnore the variability and hope for the best." *Id.* at 191. Presumably, the agency figures here that any variability is likely to be small, such that an estimate that ignores it will not be far from the truth.

221. *See id.* at 192.

222. Physiologists understand the mechanisms by which humans grow and therefore have a sense of the biological boundaries of the distribution; they can thus say that virtually no adults are above or below the 70 kg value by more than a factor of three. *Id.* at 191-94. Note that the judgment that the average adult weight is a useful surrogate for the variable quantity for regulatory purposes has been criticized for failing to take children into account. *See generally, e.g.*, NAT'L RESEARCH COUNCIL, PESTICIDES IN THE DIETS OF INFANTS AND CHILDREN (1993). A similar criticism might be raised if a certain subpopulation, for example Asian-Americans, occupied a particular portion of the body weight distribution for the general population. *See* 2 THE PRESIDENTIAL/CONGRESSIONAL COMMISSION ON RISK ASSESSMENT AND RISK MANAGEMENT, RISK ASSESSMENT AND RISK MANAGEMENT IN REGULATORY DECISION-MAKING: FINAL REPORT 89 (1997).

223. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 193.

224. *See, e.g., id.* The reference to "dirt-eating children" is to Breyer's emphasis on this scenario as an example of environmental regulation that "goes too far" to address the circumstances of the highly exposed. Breyer, *supra* note 54, at 11-12, 75. Note that the choice of a maximum exposure scenario may actually aggregate several choices in the face of variability. Thus, the choice to protect children who eat large amounts of dirt might

population, which may require them to focus on responses of a certain subpopulation (e.g., asthmatics, with respect to some air contaminants). As with the choice of a mean value, a choice of a maximum value is a choice to describe one situation out of the range of actual situations. However, where the quantity that varies is exposure, the choice of a maximum value for use in setting environmental standards will also account for other, lower exposure scenarios. For example, standards set to protect individuals residing at the fenceline will also protect less-exposed individuals residing miles away from the polluting source. As with the choice of an average value, a choice of a maximum value has the virtue of administrative ease. However, the choice of a maximum value may involve greater costs to the polluter being regulated.

Finally, health and environmental agencies occasionally employ a fourth strategy, disaggregating the data to represent different subgroups or subpopulations. In the case of interindividual variability, this entails dividing the general population into as many different subpopulations as is warranted for regulatory purposes. By this device, although variability is relatively large over the entire data set, the variability within each subset can become sufficiently small. For example, if there are age-related differences in individuals' susceptibility to ionizing radiation, an agency might divide the general population into subpopulations representing 10-year intervals, and conduct separate assessments of the risk from ionizing radiation for each subpopulation.[225] Or if there is a bimodal distribution with respect to susceptibility, with a minority of individuals who are hypersusceptible relative to the majority (e.g., asthmatics, with respect to some air contaminants), agencies might disaggregate the general population into two subpopulations (e.g., asthmatic and non-asthmatic).[226]

The appropriateness of adopting any particular strategy depends in part upon information about the extent of the variability and the shape of the distribution. It also depends upon whether laws or norms identify subpopulations of concern among the general population (does the relevant legislation require agencies to target children or other sensitive members of the human population? do other sources of law counsel agencies to address particu-

involve the choice of a minimum value for body weight and the choice of a maximum value for the quantity of soil ingested by humans.

225. *See* SCIENCE AND JUDGMENT, *supra* note 43, at 191.

226. *Id.* at 206.

lar subpopulations?). Notably, the NRC concluded in 1994 that EPA's past efforts failed to deal explicitly with important sources of variability, and relied instead on an ill-suited mix of strategies.[227]

It is important to keep in mind that whichever strategy is selected, an agency is choosing among actual, known values. In responding to variability, an agency chooses one actuality over another actuality. In cases of interindividual variability, whether in susceptibility or exposure, an agency chooses one individual's actual circumstances over another's.

2. *How agencies and courts have misunderstood the difference between uncertainty and variability.*

Agencies and courts have at times confused uncertainty and variability. Apparently viewing the two as interchangeable, they have permitted trade-offs between responses to uncertainty and responses to variability of the following sort: because an agency has chosen a conservative estimate for the cancer potency factor ("CPF")—a value about which considerable uncertainty exists—it is permissible to choose an average value for the fish consumption rate—a value that is highly variable. For example, according to the Ninth Circuit in *Dioxin/Organochlorine Center v. Clarke*,[228] because the CPF for dioxin is conservative, it is permissible to choose a fish consumption rate of 6.5 grams/day, which only arguably represents the average of the general population and clearly ignores the fish consumption patterns of Native American subpopulations. EPA and the Ninth Circuit appear to have countenanced this trade-off, at least in part, on the theory that individuals in the more-exposed subpopulation would still be "adequately" protected, *thanks to or as a result of* the conservatism of the cancer potency factor. This approach fails to recognize, however, that to the extent that the agency has conservatively set the CPF, it has done so for a reason—to address uncertainty. Uncertainty in toxicity assessment arises from gaps in the available data. Thus, the quantum of conservatism that is built into such a choice of the CPF already serves the function that it is designed to serve. It is needed to tip the scales of error in favor of overestimation, here, of cancer potency. It is not available to do additional work. It cannot also perform the function of reducing or mitigating the increased

227. *Id.* at 194-95.

228. 57 F.3d 1517 (9th Cir. 1995).

exposure of those individuals who are members of highly exposed subpopulations.

Moreover, this approach elides the differences between variability and uncertainty and obfuscates the different values and policy choices that are involved in agency responses to each. To illustrate, suppose there were some "extra" quantum of conservatism associated with the choice of the CPF, that the uncertainty surrounding the CPF only "truly" warranted a less conservative CPF. The agency and the court might then have been able to find that the unduly conservative CPF would have the same mathematical effect on the ultimate prediction of risk as the choice of some correspondingly greater value for the FCR. Because both the CPF and the FCR are in the numerator of the risk assessment equation, this effect on the prediction of risk might have been the same as accounting for some individuals' higher FCRs. Of course, neither the agency nor the court in *Dioxin/Organochlorine Center* made such a finding of any "extra" quantum of conservatism.[229] Even if they had, however, neither the agency nor the court would have dealt consciously with interindividual variability. Neither would have talked about the choices required in order to account for the fact that we *know* there are actual individuals consuming fish at the high end of the distribution and we know *who* they are. Neither would have engaged the debate "about who merits being safe and who may end up being sorry."[230]

Health and environmental agencies have not to date thought carefully and in a focused manner about how to address variability. They have not deliberated about the choice of how much protection to afford individuals at the extreme of an exposure distribution, particularly where identifiable subpopulations occupy the different portions of the distribution. Agencies need to think about these questions in a different way than they think about responses to uncertainty, because the issues are profoundly different. Agencies need to keep in mind that the debate about whether risk assessment's response to uncertainty is "too conservative" leaves untouched important questions about its responses to variability and who merits protection.[231]

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229. Saying that the CPF for dioxin is the most stringent in the world is not the same as saying that the CPF is *too* conservative.

230. Finkel, *supra* note 215, at 605.

231. *Id.*

V. VARIABILITY, IDENTIFIABILITY, AND THE CASE FOR DIFFERENTIAL TREATMENT OF HIGHLY EXPOSED NATIVE AMERICAN SUBPOPULATIONS

Large variability in fish consumption rates, and the location of identifiable subpopulations at the high end of the exposure distribution, raise implications for current agency risk assessment practice. As discussed above, the available fish consumption data (both anecdotal and quantified) paint a clear picture: variability is large and the distribution is skewed. I will use the shorthand "variability" to refer to these tandem aspects of the data. The available fish consumption data also permit us to identify particular subpopulations, such as Native Americans of the Pacific Northwest, that occupy the high end of the exposure distribution for fish consumers. I will use the shorthand "identifiability" to refer to this feature of the data.

As outlined above, under current risk assessment practice, agencies may choose from among four responses to variability: ignore the variability; select an average or median value from the distribution; select a maximum or minimum value from the distribution; or explicitly disaggregate the distribution into relevant subpopulations. Health and environmental agencies typically make numerous judgments and tradeoffs in deciding how they will respond to variability. Statutory directives may set boundaries for these judgments; often, however, these directives give agencies wide berth. Concerns of cost, administrability, and political feasibility clearly figure in agencies' decisions here, often properly so. However, tradeoffs that may be permissible for the general population become impermissible where the highly-exposed subpopulations are Native Americans.

Part V.A elaborates the features of variability and identifiability that characterize the relevant fish consumption data. Given these features of the data, Parts V.B and V.C argue for differential treatment of the highly-exposed Native American subpopulations on two bases. As a first cut, differential treatment of any highly-exposed subgroup is necessitated by the mere fact that such a subgroup has emerged from the data in a context where the stakes are high. Where a highly exposed subgroup becomes identifiable as such, agencies need to attend to their circumstances. This is so regardless of the identity of the subgroup. Candidates for differential attention by dint of this first cut might include children, recreational fishers, or Native Americans. Although not inherently

limited to Native American subgroups, the implications of this first cut for Native American subgroups will be examined in Part V.B. As a second cut, differential treatment is necessitated here because of the identity of the highly-exposed subgroup. Native American subpopulations present a particular case that has normative and doctrinal dimensions, only some of which are applicable to other subgroups. The relevant normative considerations include respect for cultural integrity, equality, and process. The applicable doctrinal constraints arise from treaties, the trust responsibility, and Title VI of the Civil Rights Act of 1964. The justifications for the second cut are developed in Part V.C.

A. *Variability, Identifiability, and Fish Consumption Data*

1. *Variability of fish consumption data.*

As the fish consumption data surveyed above in Part III.D.3 indicate, variability in consumption rates is large, and the resulting distribution is skewed such that there is a long upper tail. If inter-individual variability for a particular parameter in the exposure portion of the risk assessment equation were small, agencies would not need to be concerned about accounting for the variability and could freely choose a mean or median value—or any value at all within the distribution—as a reasonable surrogate for all values. There would be no hard call to be made about who merits protection and who doesn't. As exposure evidence reveals more marked variability, however, we move away from this easy case. Information about the shape of the distribution becomes more important, and the judgment calls involved in choosing a value must be much more carefully considered.

As variability becomes large, individuals at various points on the distribution experience quite different exposures. If variability exists but the distribution is "normal,"[232] a mean or median value might still fairly reliably serve as a surrogate for all values. In any "normal" distribution, individual values will be symmetrical about

232. It is perhaps telling that statisticians' definition of "normal" historically connoted a sense of natural, ideal, and right. *See, e.g.*, LOTHAR SACHS, APPLIED STATISTICS: A HANDBOOK OF TECHNIQUES 58 (Zenon Reynarowych trans., 1982). Although "normal" has a purely technical meaning for statisticians today, outliers remain problematic for statisticians. The existence of individual values at the extremes of a distribution are suspected of arising from error, and are susceptible to being dismissed or removed from consideration in order to ensure a tidy distribution that conforms to expectations and is easier to work with. *See, e.g., id.* at 59; GEORGE W. SNEDECOR & WILLIAM G. COCHRAN, STATISTICAL METHODS 39-41, 46-47, 135-37, 279 (7th ed. 1980).

the mean and the probability density (i.e., the height of the curve for a given value on the x axis) will have its maximum at the mean.[233] The mean will equal the median value: half the population will lie above this value, and half below. We might be willing to accept the choice of a mean or median value for a standard normal distribution, because this choice does not have the effect of "averaging away" individual characteristics or situations very far away from those shared by the bulk of the population.[234] A choice of the mean or median, of course, would mean a greater level of protection for the average exposed individual than for the maximally exposed individual—a differential that is exacerbated as variability increases and values at the extreme of the distribution become further removed from that of the mean (lesser exposed individuals would be over-protected, and so are not of concern, i.e., although their exposure scenario is not chosen as such, the choice of a scenario more dire than theirs more than accounts for their circumstances).

The difficulties presented by large variability are compounded when the distribution is not normal but skewed such that it has an extremely long upper tail. In a skewed distribution with a long upper tail, the mean and median values are no longer identical. The mean value will be greater than the median value, because the mean takes equal account of each individual *value*—including the values at the extreme—whereas the median takes equal account of the *existence* of each individual value.[235] In cases of interindividual variability, the fact that at least a few individuals will experience vastly different—and, crucially, greater—exposures than the median or even the mean may render either version of the second strategy inappropriate. Here, the choice of a median or mean value may severely underestimate the exposure of (and thus the risk to) the maximally exposed individuals. Indeed, even a 90th

233. SNEDECOR & COCHRAN, *supra* note 232, at 39-63.

234. In a "standard normal" distribution, 50% of the individual values will lie within 0.674 standard deviations from the mean; roughly 2/3 of all individual values will lie within one standard deviation from the mean; and 90% of the individual values will lie within 1.645 standard deviations. SACHS, *supra* note 232, at 58-64. Statistical methods teach that "[v]ery extreme deviations from the mean . . . exhibit so tiny a probability that the expression 'almost impossible' seems appropriate." *Id.* at 60. Of course, the fact that a distribution is standard normal says nothing about the value for the standard deviation, a point which is of some relevance in the context of an exposure distribution.

235. To illustrate, consider a distribution of five values, comprised: 1, 2, 3, 4, and 100. The median value is 3. But the mean is 22.

percentile value may underestimate exposure to those maximally exposed if the upper tail is extremely long.

Given the fish consumption evidence outlined above, it is clear that marked variability characterizes an important parameter in the exposure equation. It is also clear that a distribution that included the FCRs of the individuals evidenced by the CRITFC and Puget Sound studies would not be normal, but skewed, with a long upper tail. Legislative and agency policies that were formulated assuming little or no variability and a normal distribution should be revisited.[236] Additionally, agency responses to variability that were founded on the assumption that the identities of individuals occupying different regions of an exposure distribution are unknown and unknowable should be reconsidered where this assumption does not hold.

2. *Identifiability of Native American subpopulations.*

Even where agency risk assessors are aware of variability in parameters contributing to exposure, such as the fish consumption rate, they tend not to ask questions about the *identity* of the individuals described by any given point on an exposure distribution.[237] Unless specifically prompted to do so, a risk assessor is unlikely to look for patterns of identity within an exposure distribution. Thus, risk assessors may not be predisposed to recognize instances where identifiable subpopulations occupy a particular region of an exposure distribution.

In the regulatory context, risk is generally expressed and considered in terms of incremental increases in the chance of some occurrence (e.g., developing cancer) in an individual's lifetime. The individual here is meant to be generic. A risk assessor's conclusion that a particular cleanup level for surface water will result in a lifetime increased cancer risk of $1(10^{-6})$ for those who eat fish from that water is meant to refer with equal likelihood to every individual who is an intended beneficiary of the cleanup action.[238]

236. Of course, this is not the first context in which legislatures and agencies aiming to protect human health have encountered variable populations. For example, legislative directives to protect "the most sensitive" members of the population or to protect "the individual most exposed" speak to precisely this feature of the data. *See, e.g.*, Clean Air Act, 42 U.S.C. § 7412(f)(2)(A) (1990).

237. MacLean, *supra* note 57, at 2; *see also* SCIENCE AND JUDGMENT, *supra* note 43, at 213-17 (discussing identifiability with respect to variation in the context of susceptibility).

238. *See, e.g.*, MacLean, *supra* note 57, at 75, 78-79 ("Risk analysts have tended to focus only on the magnitude of the risk, however distributed . . . . If exactly one person will die

How descriptive this estimate is of any one individual's risk, however, depends on how closely that individual's particular circumstances of susceptibility and exposure track the assumptions used by the risk assessor to arrive at her estimate of risk.

Some commentators have argued that if variability exists, but the identity of the individuals who will occupy a particular region of the distribution is not and cannot be known, agencies might legitimately ignore the variability. For example, some members of the National Research Council of the National Academy of Sciences have suggested that variability can be viewed as irrelevant "if the variation is and will remain unidentifiable."[239]

> [S]ome argue that people should be indifferent between a situation wherein their risk is determined to be precisely 10^{-5} or one wherein they have a 1% chance of being highly susceptible (with risk = 10^{-3}) and a 99% chance of being immune, with no way to know which applies to whom. In both cases, the expected value of individual risk is 10^{-5}, and it can be argued that the distribution of risks is the same, in that without the prospect of identifiability no one actually faces a risk of 10^{-3}, but just an equal chance of facing such a risk.[240]

However, the necessary condition for this situation, that the variability is and will remain unidentifiable, is unlikely to exist in the context of exposure in health and environmental risk assessment. Information about *exposure* is more readily available than information about *susceptibility*. Even crude or anecdotal information about exposure indicates the probable identity of the individuals or group of individuals in a particular region of a distribution. And, of course, Native Americans and other groups *have* identified themselves among the highly exposed and have begun to gather and quantify their observations. With regard to fish consumption rates, evidence that identifiable subpopulations occupy the high end of the distribution means that agencies cannot operate as if they do not know the identities of the most highly exposed. A choice of the average or median value now means not only that they have decided that it is appropriate to underestimate the exposure of *actual, known* individuals: among others, Native Americans of the Pacific Northwest. Agencies can no longer claim ignorance

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each year, the $1(10^{-6})$ magnitude indicates our ignorance in advance about who it will be.").

239. SCIENCE AND JUDGMENT, *supra* note 43, at 213.

240. *Id.* at 213-16. Note that the view that risk is either one or zero is controversial and does not command consensus of the National Research Council. *Id.*

as to who it is that may end up being sorry when they choose to target protection at the mean or median and can no longer take refuge in *how many* this choice protects. The information on identity has shifted the debate to include not only *how many* but also *who*. In the face of variability and identifiability, the only supportable regulatory strategies are a focus on the most exposed, or disaggregation.

While, as a general matter, agency risk assessors may appropriately consider whether the statistical lives saved by protecting to the level of the maximally exposed individual are worth the cost of doing so,[241] they can no longer be thought to be debating identityless, anonymous, statistical lives. This is not, as noted, a matter of being more or less conservative. It is a matter of deciding with full knowledge whom to protect. It involves nothing less than deciding, to paraphrase Annette Baier, which harms to notice and on whom we will with good conscience impose death, or risk of death.[242]

On this understanding of the problem, I argue that in order to make good decisions—decisions that are both scientifically defensible and just—agencies must take variability and identifiability into account. The next two Parts advance two bases for differential treatment of highly-exposed Native American subpopulations. Part V.B explores a first cut: differential treatment of any highly exposed subgroup is necessitated by the fact that such a subgroup has emerged from the data in a context where the stakes are high. Part V.C explores a second cut: differential treatment is necessitated by the identity of the subgroup that is highly-exposed, i.e. Native Americans.

B. *Differential Treatment: Highly-Exposed Subpopulations*

The mere fact that highly exposed subgroups exist in a context where the stakes are high necessitates differential treatment by health and environmental agencies. These agencies' regulatory decisions must be scientifically defensible, or at the very least not "arbitrary [or] capricious."[243] Because particular subgroups turn out

241. *See, e.g.*, BREYER, *supra* note 54, at 11-12, 46-47 (suggesting that the costs of protecting those maximally exposed—an aspect of the problem of regulating "the last 10 percent"—are not justified given scarce resources).

242. *See* Baier, *supra* note 66, at 49.

243. Courts' review of agency decisionmaking is generally highly deferential, guided by the "arbitrary and capricious" standard. Administrative Procedure Act, 5 U.S.C. § 706(2)(A) (1994); *see* Chevron v. Natural Resources Defense Council, 467 U.S. 837 (1984); Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 416 (1971).

to be more exposed or more susceptible than members of the general population, agencies must recognize and attend to their different circumstances. This imperative is a matter of accurately diagnosing and credibly responding to public health and environmental problems. The more significant the differences in the circumstances of exposure or susceptibility between the subpopulation and the general population, the more suspect an agency decision that fails to disaggregate these groups for differential treatment. Agencies do not make defensible decisions if they either fail to recognize subgroups defined by scientifically-relevant features or collapse for similar treatment two or more subgroups; at the very least, such choices require justification.

Health and environmental agencies' task in setting health-based environmental standards is to protect each human's health. The stakes indeed are high: "death, or risk of death."[244] Health or environmental agencies cannot defensibly ride roughshod over important, scientifically-relevant differences, e.g., differences in exposure circumstances. Whether an individual's circumstances permit her to be relatively insulated from environmental toxins or whether they require her to be relatively exposed to them, an agency's task is to set standards that ensure her a healthful environment. An agency's duty is to the most exposed as it is to the least exposed. A corollary to this point is that no one individual's claim to protection should turn on how many others share her circumstances of exposure.

As agencies have obtained a better picture of the affected population's exposure, subpopulations have tended to emerge—subgroups of individuals whose exposure scenario is different from the general population's exposure scenario, and different along similar lines. In the previous Part, I termed this feature of the data "identifiability." Identifiable subgroups whose circumstances make them more highly exposed that the general population are of especial regulatory concern. Thus, for example, where the health threat comes from ingestion of contaminated fish, recreational fishers have emerged as a relevant subpopulation because the groups' members consume fish at significantly greater rates than the average or general population. Children and women have also emerged as relevant subpopulations because each group's mem-

244. *See* Baier, *supra* note 66, at 49 ("It is not merely a question of whose lives we should save by what measures with whose money, but whom . . . we will with good conscience kill, cause to die, or let die, and by what measures or neglect.").

bers weigh significantly less than the assumed norm: a 70kg adult male.[245] Similarly, where the health threat comes from inhalation of polluted air, asthmatics have emerged as a relevant subpopulation because of this group's heightened susceptibility relative to the non-asthmatic population. These subgroups are defined in each case according to shared scientifically relevant attributes[246]—rate of fish consumption is such an attribute for exposure to an array of bioaccumulative toxins; age-correlated body weight is such an attribute for exposure to developmental toxins in particular; and asthma is such an attribute for susceptibility to the deleterious effects of various air pollutants. To do an adequate job, health and environmental agencies need to devise a more refined, nuanced response than would be necessary in the absence of variability and identifiability.

These imperatives do not depend on the *identity of* the subgroup, but on the fact of *identifiability as* a subgroup. That is to say, whether the subgroup is comprised of recreational fishers, Native American fishers, children, women, or asthmatics, so long as the subgroup is identifiable as such along scientifically relevant lines, it warrants attention as a subgroup, especially where it is more at risk, more exposed. And, it is important to note that there may be more than one subpopulation that warrants such attention in any given regulatory context. Here, it follows, it will not do to collapse distinctions *among* subpopulations, and agencies cannot as a matter of course lump together all those who are different in some measure or kind from the general population. This point is relevant where exposure to environmental toxins is via fish consumption. Although recreational fishers, Native American fishers, African-American fishers, Asian-American fishers, and perhaps other subpopulations can all be described as subpopulations whose exposure scenarios are different from that of the general population, there are differences as well among these subpopulations—differences that in many cases will make it inappropriate to ignore the distinctions among them. Where there are significant differences in the fish consumption rates and practices among subpopulations, agencies should maintain distinctions between them.

245. *See, e.g.*, Draft AWQC Revisions, *supra* note 38, at 43,800.

246. Agencies do not appear explicitly to attempt to define what they term a subpopulation to comport with socially, politically, or legally determined groupings. Thus, agency risk assessors' use of terms describing groups within the larger population may or may not track other bases for identifying socially, politically or legally relevant groups. See, for example, discussion *supra* note 194 and accompanying text.

Agencies, for a variety of reasons, do not always attend to the different exposure circumstances of subgroups. But agencies should be least troubled by claims for differential treatment of subgroups when the claims are grounded in scientifically relevant characteristics of these groups, and the differences in circumstances are *significant.* In the case of exposure via fish ingestion, this claim to differential treatment may be available to several different subpopulations, although it is beyond the scope of this paper to assess the merits of these possible claims. This claim to differential treatment is assuredly available to some Native American subpopulations.

1. *Agencies' resistance to the different exposure circumstances of Native American subpopulations.*

Agencies, by and large, have been and continue to be unusually resistant to the different circumstances of Native Americans as a subgroup. Agencies' recalcitrance has taken several forms. First, as described above, agencies have only belatedly undertaken or supported data-gathering efforts with respect to Native Americans. While agencies will have limited resources, one might expect that to the extent data are gathered for any subpopulations, the first priority would be the subpopulations likely to be most exposed, i.e, Native Americans.

Second, even with some quantitative data in hand, EPA, in particular, persists in its failure to attend to the different circumstances of Native American subpopulations. Although EPA's Draft Ambient Water Quality Criteria Revisions make some inroads, the Draft at the same time instates a litany of judgments that together work to deny rather than recognize Native consumption patterns. The result of these judgments is that American Indians' exposure will be systematically underestimated—and the health of these peoples systematically underprotected.

Fish consumption rate. The EPA Draft chooses a value for its default FCR that purports to be "representative" of subsistence and minority fishers. This number, 86.30 grams/day, however, is not taken from studies of the supposedly represented populations, although EPA had these studies.[247] Rather, this value represents the ninety-ninth percentile of the *general population,* which is claimed to be "within the range of *average* intakes of subsistence/

247. *See* EPA, Technical Support Document, *supra* note 172 at 98-102. Included among the listed studies are both the CRITFC and the Toy et al. studies.

minority anglers."[248] The choice to ignore actual data, available in studies of subsistence populations, including the CRITFC and Toy, et al. studies, in favor of extrapolation from a study of the general population to a number that is deemed "representative" of subsistence populations undermines EPA's claim that in the absence of local data it prefers the "use of data reflecting similar geography/population groups" and EPA's claim that it favors real, quantified data and "definitive studies" over information that is constructed and speculative. In addition, EPA uses the term "subsistence" loosely and fails to differentiate among subsistence subpopulations and minority subpopulations. While agencies should indeed be attending to other individuals and groups consuming fish at higher rates than the general population, the EPA's decision to lump all of these higher consumers together here works to the disadvantage of Native American subpopulations, which tend to have the very highest fish intake rates.[249] Finally and importantly, the choice to aim for a number "within the range of *average* intakes" of subsistence fishers/minority anglers requires justification, given that variability even within these subpopulations (especially as EPA has considered them) is large, and the distribution is skewed with a long upper tail. The FCR—and thus exposure—of those Native Americans shown to consume fish at the greatest rates will be considerably underestimated by aiming for a number "within the range of *average* intakes." Whereas EPA protects the general population at the 90th percentile, EPA protects "subsistence fishers/minority anglers" only at the average. The stakes are high, yet EPA has offered no justification for its choice. Further, EPA suggests the possibility of using a lower default FCR for subsistence/minority fishers, 30.04 grams/day, which it presents as being "lower in the range of averages."[250] Again, EPA has offered no justification.

Moreover, in arriving at its default fish consumption rate, EPA makes many choices that together contribute to the systematic underestimation of Native Americans' exposure. These choices have been described in Parts IV.B.1-.2. I highlight here the cumulative impact of EPA's judgments. First, EPA excludes salmon from the FCRs it generated by defining them as a "marine" species. Of

248. Draft AWQC Revisions, *supra* note 38, at 43,762.

249. Included among the "subsistence/minority anglers" that EPA's default value is meant to represent—the sources of "the range of average intakes" referenced by EPA—are fishers identified as Native American, African-American, or Caucasian, and other individuals who simply have the habit of eating a lot of fish. *See* discussion *supra* note 194.

250. Draft AWQC Revisions, *supra* note 38, at 43,762.

course the effects of this choice are visited much more harshly on the Native American subpopulations for whom salmon are important and a significant source of fish intake than on the general population.[251] EPA explains this call by observing that salmon are anadromous and thus spend a portion of their lifecycles in the open ocean as opposed to in freshwater or estuarine environments, and from this description surmises that salmon must not have become contaminated in waters of regulatory concern. EPA offers no direct evidence of relative uptake as between salmon's freshwater/estuarine versus marine habitats. EPA makes this call despite a growing body of evidence that salmon uptake significant amounts of contaminants contained in freshwater and estuarine environments, while salmon are in residence there and during outward and homeward migrations.[252] EPA excludes salmon even though salmon have comparatively high lipid content, such that small concentrations of lipophilic substances in the aquatic environment will correspond to high concentrations in salmon fish tissue relative to other, lean species.

Second, EPA bases its estimates of fish consumption on a per capita figure, which includes people who do not eat fish at all. This choice has the effect of diluting the various point estimates of the FCR. As a general proposition, it seems an odd choice to consider the fish consumption practices of those who do not consume fish—this seems rather like studying the health problems of nonlaborers to determine the need for occupational health and safety standards. But this choice may be particularly burdensome here for those consuming fish at rates in the upper tail of a distribution. While the inclusion of the many "zero" values affects the whole curve, such that the numerical value for each point estimate is decreased in some measure, the effect in the upper reaches of the distribution is the most dramatic. Again, this judgment burdens Native Americans of the Pacific Northwest.

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251. This is so to the extent that EPA's choices in fashioning its default are followed by state agencies, which historically has been the norm. *See* discusssion *supra* notes 209-210 and accompanying text.

252. *See, e.g.*, McCain, *supra* note 186 at 10; J.E. Stein et al., Contaminant Exposure and Biochemical Effects in Outmigrant Juvenile Chinook Salmon from Urban and Nonurban Estuaries of Puget Sound, Washington, 14 ENVTL. TOXICOLOGY & CHEMISTRY 1019 (1995); see also, Mary R. Arkoosh et al., Effect of Pollution on Fish Diseases: Potential Impacts on Salmonid Populations, 10 J. AQUATIC ANIMAL HEALTH 182 (1998). As CRITFC has pointed out to the EPA, the choice to exclude salmon "ignores salmon's life history and emerging evidence on the uptake of chemicals by juvenile salmon, and egg fry, as well as adverse impacts on returning adults." CRITFC Comments, supra note 1 at 9.

EPA may be able to point to plausible science-policy or policy arguments in service of some or all of the judgments that it makes along the way to arrive at its default numbers. For example, one might argue that EPA's decision to use cooked weight values rather than uncooked weight values for fish intake could have gone either way and EPA gives reasons for its decision to opt for cooked weights.[253] Even allowing this point, however, EPA's judgments seem less supportable when considered together—as they must be, given their functional relationship in accounting for exposure. Thus, while the decision to opt for cooked weight values has the effect of decreasing the FCR by twenty percent and, as EPA puts it, "results in a *slightly* lower intake rate and *slightly* less stringent AWQC,"[254] the effects of this decision cannot be considered alone. Rather, they need to be viewed together with (1) EPA's judgment that salmon ought to be excluded (an additional 13% reduction in the FCR, and a further decrease in the protectiveness of the standards), (2) its judgment that marine species in general ought to be excluded from the FCR, and (3) its choice to gauge protection by the quantities of fish eaten by fish consumers and fish nonconsumers. Taken together, these decisions result in underestimation of Native Americans' consumption.

These criticisms of the proposed FCR are not exhaustive; I have provided but a brief discussion, meant to highlight the cumulative results of EPA's numerous judgments for Pacific Northwest Native peoples. Indeed it seems that whenever a call was to be made, EPA has selected the option that contributed to underestimation of Native Americans' exposure.

Acceptable risk levels. More fundamentally, EPA says that the risk range it recommends is $1(10^{-7})$ to $1(10^{-5})$ for the general population, but notes that it will approve states' actions that result in risks as high as $1(10^{-4})$ for subsistence populations. As noted above, this recommendation would instate in EPA's criteria document the "lower yet adequate" justification offered that was offered in litigation, in *DOC v. Clarke.* As there, this recommendation works a questionable discrimination in and of itself, as will be discussed in the next section. It is made all the more problematic when coupled with the EPA's systematic underestimation of Native fish consumption rates outlined in the preceding section. And, if experience holds, states are likely to choose the lowest permissible

253. Draft AWQC Revisions, *supra* note 38, at 43,803-04.

254. *Id.* at 43,803 (emphasis added).

FCR values, and to aim for the least protective risk level[255]—a likelihood of which EPA is surely aware.

Although the Draft makes some progress when viewed against EPA's current practice, it continues to deny proper attention to Native Americans's different circumstances. In light of the variability and identifiability EPA and state agencies need to take care that the choice of an FCR and other judgments respecting exposure do not work cumulatively to underestimate Native Americans' exposure. Furthermore, EPA and state agencies cannot countenance one level of risk for the general population and another, greater level of risk for Native American subpopulations.[256] How, exactly, agencies ought to implement these claims is purposefully not specified here. Among other things, respect for the government-to-government relationship requires consulting a tribe's position on this question, a point discussed at greater length in Part VI. The appropriate FCRs and judgments will depend on the context and on the affected subpopulation.

2. *Counterarguments and responses.*

These claims about appropriate agency responses to variability and identifiability are controversial. One counterargument is that the selection of a higher FCR, reflective of some subpopulations' higher consumption rates, may not ultimately make that much of a difference in terms of statements about risk or the resulting environmental standards. Unless the change in FCR is an order of magnitude or more, there is likely to be no meaningful effect on the outcome when the standards are being set for extremely carcinogenic agents, such as dioxin, because the cancer potency factor ("CPF") is so large as to dampen the effect of changes to the other parameters in the risk assessment equation. The response to this argument is several-fold. First, the requisite order of magnitude difference in FCR will be present for some subpopulations, especially Native Americans. As the data outlined above demonstrate, some Native Americans in the Columbia River Basin consume fish at the rate of 952 grams/day, a number two orders of magnitude greater than the 6.5 grams/day currently assumed by EPA, and an order of magnitude greater than the 86.3 grams/day proposed. Second, the argument made in the context of potent carcinogens

255. *See generally, e.g.*, Kirsten H. Engel, State Environmental Standard-Setting: Is There a "Race" and is it "To the Bottom"?, 48 HASTINGS L.J. 271 (1997).

256. CRITFC Comments, *supra* note 1 at 8-9.

like dioxin is not as plausible for other, less potent carcinogens. The CPF of 2,3,7,8 TCDD (dioxin) is [150,000 mg/kg body weight/day]$^{-1}$; the CPF of DDT is (only) [0.34 mg/kg body weight/day]$^{-1}$.[257] In fact, changes to the other parameters in the risk assessment equation, such as the FCR, will not get muted in most cases. Third, even small differences in outcome are important to affected peoples, whose health and way of life is at stake. And, given that these individuals are the ones likely to be exposed to numerous environmental hazards from a variety of sources, the cumulative effect of even small changes in outcome (in terms of risk or in terms of the environmental standard) means that even small changes cannot be disregarded.[258] CRITFC adds: "EPA [in its Draft AWQC Revisions] ignores the reality that sensitive populations may have significant cultural practices and confounding, underlying health problems and socio-economic conditions that may compound an individual's or a population's risk by several magnitudes higher than calculated by EPA's typical risk methodology."[259]

Some commentators make another counterargument: they claim that no one individual's exposure is likely actually to be reflected by a composite of maxima for the variable parameters that comprise the exposure portion of a risk assessment calculus. That is to say, while an individual might be among the most highly exposed, i.e., fall at the 90th or 95th percentile of the distribution, for one component of exposure, that same individual is unlikely also to be among the most highly exposed, i.e., fall at the 90th or 95th percentile, for every other component that goes into calculating exposure. For example, in the context of air pollution, they argue that no one individual is likely to live at the fence-line *and* to live there for his or her entire lifetime *and* to spend the bulk of the day out of doors.[260] Therefore, it is unnecessary (and so a misdirection of scarce resources), to base environmental regulatory stan-

257. U.S. EPA, Integrated Risk Information System Database (visited Nov. 16, 1999) <http://www.epa.gov/iris/> (listing EPA's current CPFs or "oral slope factors"). Note that the CPF for 2,3,7,8 TCDD is in the process of being reassessed. Other common examples include aldrin, with a CPF of [17 mg/kg/body weight/day]$^{-1}$, benzo-a-pyrene, with a CPF of [7.3 mg/kg/body weight/day]$^{-1}$, and chlordane, with a CPF of [0.35 mg/kg/body weight/day]$^{-1}$.

258. *See, e.g.*, BANSAL & DAVIS, *supra* note 97, at 57.

259. CRITFC Comments, *supra* note 1, at 8.

260. *See, e.g.*, BREYER, *supra* note 54, at 46-47 (suggesting that EPA's "strictly mechanical assumption that the individual is exposed to emissions at a point 200 meters from the factory, all day, every day, for 70 years" is unrealistically "conservative"); John D. Graham, *Improving Chemical Risk Assessment*, 14 REG. 14 (1991).

dards on a maximum value, rather than a mean or median value, for every variable quantity that contributes to exposure; instead, there is room to choose a maximum value here, but a median or mean value there. These commentators cite statistics depicting how frequently the "average American" moves his or her residence, and how much time the "average American" spends indoors to support the argument that the maximum value for each of these three parameters affecting exposure to air contaminants is unlikely to describe any single individual.[261]

This argument may have merit when applied to transient non-Indians. In the context of exposure via fish ingestion, this argument may have merit when applied to "the typical U.S. consumer eating fish in moderation from a variety of sources."[262] But it fails when applied to many Native Americans of the Pacific Northwest. For many Native Americans in this region, actual individuals' exposures *are* described by a composite of the maxima. Actual individuals *do* live in the same place[263] and fish from the same spots[264] and consume relatively large quantities of fish per day for a whole lifetime. Indeed, many feel that they could not do otherwise.[265] Yet

261. *See, e.g.*, BANSAL & DAVIS, *supra* note 97, at 27; BREYER, *supra* note 54, at 46; Graham, *supra* note 260, at 15.

262. Upon release of its 1996 summary of state-issued fish advisories, the EPA made precisely this assumption about the "average American," while acknowledging that practices different from the typical consumer were likely to lead to increased exposure:

> The typical U.S. consumer eating fish in moderation from a variety of sources and eating a variety of species is not believed to be at increased risk . . . . The populations with the highest potential of increased risk are those who routinely eat freshwater fish from a single location or region that is known to be impacted by contamination.

U.S. ENVTL. PROTECTION AGENCY, NOTE TO CORRESPONDENTS: EPA ISSUES 1996 FISH ADVISORY DATA (1997).

263. In fact, most of the peoples of this region have occupied the same places from time immemorial. *See, e.g.*, Landeen & Pinkham, *supra* note 125, at 51-54 (recounting Nez Perce oral history and other historical evidence of the creation and location of the Nez Perce people (Nee-Mee-Poo or "The Real People") and quoting, in a sidebar, Allen Pinkham, who explains "[t]he Nee-Mee-Poo have occupied this country since time immemorial."). While non-Indian owned land is typically held for relatively brief periods for transitory habitation or for investment purposes, American Indian land tenure is marked by intergenerational habitation by connection to and direct dependence on the land for food and water. *See, e.g.*, Mary Christina Wood, *Protecting the Attributes of Native Sovereignty: A New Trust Paradigm for Federal Actions Affecting Tribal Lands and Resources*, 1995 UTAH L. REV. 109, 133-34.

264. *See, e.g.*, United States v. Washington, 384 F. Supp. 312, 357-82 (W.D. Wash. 1974); Jay LaPlante, *Celilo Falls: Flooded Forty Years Ago but Not Forgotten*, 2 WANA CHINOOK TYMOO 8 (1997); Terri C. Hansen & Jon Lurie, *Ecocide in Indian Country*, NEWS FROM INDIAN COUNTRY, Aug. 15, 1955, at 14, *available in* 1995 WL 15435941.

265. Columbia River Inter-Tribal Fish Commission, The Importance of Salmon to the

"stakeholders" in regulations applicable to the Puget Sound and portions of the Columbia River Basin made precisely this rhetorical case for employing a (low) diet fraction to account for the percentage of fish consumed from contaminated waters: "[A diet fraction of 0.5] is unrealistically high. *Who in the world* would expect their fish diet to come from the same contaminated source?"[266]

A final defense of the current agency practice raises the specter of the slippery slope and asks how far agencies should be expected to go in recognizing particular subpopulations' exposure circumstances. Should agencies take account of every group's notion of its special circumstances? At what point do gradations in the default FCR values become unwieldy? This slippery slope counterargument may be animated by both a concern about cost and a concern for administrability. In some cases, these concerns will carry the day. In the case of subpopulations, such as Native Americans, whose FCR is significantly greater than the FCR for the general population, however, the concern for scientific defensibility outweighs these concerns.

In summary, differential treatment of highly-exposed subgroups is necessitated by the mere fact that such subgroups exist, or have emerged from the data, in a context where the stakes are high. This is so regardless of the identity of the subpopulation—although here it turns out that the Native American subgroups have an especially strong claim for differential treatment because their exposure circumstances are indeed significantly different from the circumstances of the general population. This claim is the first cut at a response to variability and identifiability.

Tribes, (visited Sept. 14, 1998) <http://www.critfc.org.text/IMPORT.HTM> ("Salmon and the rivers they use are part of our sense of place. The Creator put us here where the salmon return. We are obliged to remain and to protect this place."). Margaret Palmer, a Yakama tribal fisher explains:

> I don't feel like it's within our rights, as the tribe as we are, to go to a different area and live off of something that maybe God has blessed them with. This is our blessing. This is the way we see it. This is where we should stay. I don't believe that I would leave the area. I believe that I would stay where I'm at—by the water. It's our lineage.

Videotape: My Strength Is From the Fish, *supra* note 1. Nor as a practical matter could the Puget Sound and Columbia River tribes simply go elsewhere. The tribes' aboriginal and treaty-based claims to land and resources are tied to specific places; the legal protections that flow from these claims cannot simply and readily be re-established elsewhere. *See* Wood, *supra* note 263, at 133-34. The particularized skills and knowledge that tribes have developed over centuries are also place-specific and not transferable to other locations. *See, e.g.*, CRITFC Comments, *supra* note 1, at 10.

266. MTCA Responsiveness Summary, *supra* note 151, at 226 (emphasis added).

C. *Differential Treatment: The Particular Case of Native American Subpopulations*

I turn now to the second cut: of the identifiable subgroups that are candidates for differential treatment, some may require agency attention because of their particular *identity*. Here, various moral and legal commitments may come into play. Agencies must address the intersection of variability and the fact that a particular identifiable subpopulation—Native Americans—occupies the high end of a variable exposure distribution. I will argue that agencies have inadequately considered the relevant normative commitments respecting cultural integrity, equality, and process, and have not registered the applicable legal obligations arising from treaties, the federal trust responsibility, and Title VI of the Civil Rights Act of 1964. While some facets of these claims may be relevant for other subgroups, Native American subgroups present a unique case.

1. *Normative dimensions.*

Agency discretion should be informed by respect for cultural integrity, freedom from both exclusionary and cultural discrimination, and principles of just process. Agencies employing QRA to set environmental standards confront numerous occasions for value judgments that profoundly affect the outcome of the standard-setting process. Risk assessors make judgments based on their personal experience, commitments, and training, but they should also consider other values. Both emerging and well-settled norms regarding ethnocultural groups in general, and Native Americans in particular, are a legitimate source of values for agencies' work affecting Native Americans' resources and ways of life. There are good reasons to recognize and have regard for groups and the host of claims that each might make as such. Our world is one of nations, peoples, clans, clubs, and other groups.[267] These existing groups are, to varying degrees, important to the well-being of their members. Groups serve as the locus of social relations, pursuits, and aspirations that have value to their members and to society as a whole.[268] Some groups, especially peoples or ethnocultural groups,[269] are absolutely central to the well-being of their mem-

267. Avishai Margalit & Joseph Raz, *National Self-Determination*, 87 J. PHIL. 439, 440 (1990).

268. *See, e.g., id.* at 447-50.

269. I recognize that these terms, and the bases for distinction that they entail, are

bers. Such groups shape to a large degree members' judgments about the opportunities and responsibilities of life, and they influence profoundly members' perceptions of themselves and others.[270] Such groups provide an anchor for members' self-identity and offer to members the security of ready belonging.[271]

As a general matter, it seems fair to recognize differences in the roles that various sorts of groups play in members' lives. Where a group plays a more central role in the lives of its members there seems to be a better case for entertaining the group's claims to differential treatment that enables it to flourish as a group.[272] We might be amenable to a broader array of claims from such groups—ranging from exemptions,[273] to assistance,[274] to representation,[275] to self-government.[276]

A *club* or *association*, such as Trout Unlimited, or the Ultimate Players Association, might advance relatively modest claims, flowing in the main from the associational values that such groups serve. A *grouping*—such as the trout-fishing public, or ultimate players worldwide—might advance even fewer claims because of the weakness of the association. The contraction of claims is justifiable because one can in some sense be a member of these groupings without even being aware that one belongs; membership is not "high profile"—it is not one of the primary means of identifying who members *are*.[277]

Moving in the other direction, a *people* or an *ethnocultural group*, such as the Nez Perce, or Native Americans, might advance broad and robust claims to differential treatment that would enable the group to flourish. The relative expansion of claims here stems from the centrality of such groups to the lives of their members

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controversial. *See, e.g.*, Ian Shapiro & Will Kymlicka, *Introduction to* ETHNICITY AND GROUP RIGHTS, *supra* note 105, at 3; Thomas W. Pogge, *Group Rights and Ethnicity*, *in* ETHNICITY AND GROUP RIGHTS, *supra* note 105, at 187, 187; Anaya, *supra* note 105, at 222.

270. Although my purpose is different, this sketch of the attributes of ethnocultural groups draws on the discussion by Avishai Margalit and Joseph Raz of features that define groups that might be candidates for self rule. Margalit and Raz, *supra* note 267, at 442-47.

271. *See id.*

272. *See id.*

273. Jacob T. Levy, *Classifying Cultural Rights*, *in* ETHNICITY AND GROUP RIGHTS, *supra* note 105, at 22, 25-27.

274. *Id.* at 29.

275. *Id.* at 43.

276. *Id.* at 32-34; *see also* Margalit and Raz, *supra* note 267, at 447-54.

277. *See* Margalit & Raz, *supra* note 267, at 445-46 (contrasting membership in a group (what I have termed a "grouping") such as the fiction-reading public with membership in groups that are more constitutive of individuals' identities).

and the value of such groups to society.[278] Such a group is characterized by a common and pervasive culture that "encompass[es] many, varied and important aspects of life;"[279] that mediates experience, informs values, conveys knowledge, and forges identity; and that "determines the boundaries of the imaginable . . . [and] the limits of the feasible."[280] Those who grow up among members of such a group will be marked by its culture. Its influence will be profound and far-reaching (though perhaps not indelible), affecting the tastes one develops, the options one appreciates as being open, and the attitudes one espouses.[281] Membership in such a group is, in part, a matter of mutual recognition, of informal or formal acknowledgment by other members that one belongs.[282] Membership is important for and constitutive of one's self-identity; membership is highly visible, and is "one of the primary facts by which people are identified," in light of which other people form expectations about *who one is* or what one is like.[283] Being a member is more a matter of belonging than achievement (although continued recognition of one's membership may in some instances and senses be conditioned on one having undertaken or having declined to undertake certain activities or achievements). One cannot, for the most part, choose to belong or to qualify for membership, *one belongs—and is perceived by others to belong—"because of who one is."*[284]

These characteristics are often interrelated. Some of them may describe groups other than peoples or ethnocultural groups. Together they not only describe peoples or ethnocultural groups, but also reveal the importance of such groups to their members and to society as a whole. Within the United States, Native American peoples exhibit, as groups, the panoply of features described above. There are thus good reasons to view the claims of these groups differently than similar claims of other groups, say Trout Unlimited or the trout-fishing public.

Moreover, within the United States, other values that should animate our policies—cultural integrity, equality, and fair process—call on us to think differently about the claims of Native

278. *See* Margalit & Raz, *supra* note 267, at 444.
279. *Id.* at 443.
280. *Id.* at 449.
281. *Id.* at 444.
282. *Id.* at 445.
283. *Id.* at 445-46.
284. *Id.* at 446-47.

American groups than about the claims of other groups. This differential treatment is warranted both as between Native American groups and clubs or associations linked by recreational predilection; and between Native American groups and other ethnocultural groups.[285] I sketch below three justifications for differential treatment of these peoples: cultural integrity, equality, and process, and note that they are supported by emerging and well-settled norms.[286] I then suggest implications for regulating agencies where variability is large, the distribution skewed, and Native American subgroups are identifiable and among the most exposed.

Protection of cultural integrity. Differential treatment for Native American groups is necessary to protect their cultural integrity. Emerging norms in the United States and elsewhere value a diversity of cultures and support the protection of cultural integrity.[287] As S. James Anaya observes, "[a]mong the important values that are embraced by enlightened societies and now featured in international human rights law is the value attached to the integrity of diverse cultures."[288] This interest in cultural integrity necessarily entails a different regard for those groups defined chiefly by distinctive cultural attributes than for other non-ethnocultural groups.[289] Professor Anaya gives this example:

> Taos Indian Pueblo, a culturally distinctive community of long-standing and continuing profound significance to its members, is clearly valued within the larger society differently from the Taos ski club. Indeed, one can easily observe that, on grounds of cul-

285. *See generally* VINE DELORIA, JR., CUSTER DIED FOR YOUR SINS (1969). Differentiation among peoples or ethnocultural groups may also require differentiation among groups classified generally as Indian, although the fact of their classification as such by the dominant society is relevant. *See* STEPHEN CORNELL, THE RETURN OF THE NATIVE: AMERICAN INDIAN POLITICAL RESURGENCE 74-76 (1988); David C. Williams, *The Borders of the Equal Protection Clause: Indians as Peoples*, 38 UCLA L. REV. 759, 804-05 (1991).

286. However, I do not attempt to examine these grounds in any comprehensive fashion, nor endeavor to flesh out the consequences of their recognition more generally as a basis for differential treatment. My aim here is more modest; and it is limited to the context at hand.

287. Anaya, *supra* note 105, at 223-24. For evidence of these norms in tribal law, see, for example, *In re* K.A.W., No. JV-86-9, 1992 WL 752134 (Comanche Child Ct. Feb. 5, 1992) (citing Comanche Child Welfare Code § 1-1-2(c)); Frank Pommersheim, *Tribal Court Jurisprudence: A Snapshot from the Field*, 21 VT. L. REV. 7, 24-28 (1996). For evidence of these norms in United States federal law, see, for example, Native American Graves Protection and Repatriation Act, 25 U.S.C. §§ 3001-3013 (1994); Native American Language Act, 25 U.S.C. §§ 2901-2906 (1990); Indian Child Welfare Act, 25 U.S.C. §§ 1901-1963 (1994); Religious Freedom Restoration Act 42 U.S.C. §§ 2000bb to 2000bb-4 (1994).

288. Anaya, *supra* note 105, at 223.

289. *See id.* at 223.

> tural integrity, we tend to attach greater importance to groups that comprise or generate distinctive cultures more than to other types of groups. Taos Indian Pueblo is understandably considered a more important nucleus of human interaction than the ski club.[290]

The growing recognition of the importance of cultural integrity justifies various sorts of protections for the groups characterized by common or pervasive cultures. Protection in this context should be understood to include not only guarding the bare survival of a culture, but also ensuring a more robust notion of cultural flourishing and development. Protection of cultural integrity should also be guided by a contemporary recognition that culture is not static[291] and that what is required to safeguard cultural integrity will likely be different for different cultures.[292]

Members of any cultural group—even a majority or dominant cultural group—have an equal claim to respect for cultural integrity. But because the integrity of cultural groups in the numerical minority, or otherwise in a nondominant position, are more likely to be vulnerable to breach than cultural groups in a majority or dominant position, a focus on the protection of minority cultural groups is justified.[293]

This is not to say that respect for cultural differences and protection of cultural integrity will not introduce complexities. Actions in furtherance of one culture will often have effects that curtail the furtherance of another or otherwise impose some costs. Attention to the kinds of effects or costs imposed by such actions is

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290. *Id.*

291. For recognition that cultural integrity is a dynamic rather than a static concept, see, for example., United States v. Michigan, 471 F. Supp. 192 (W.D. Mich. 1979) (recognizing that "[t]he mere passage of time has not eroded, and cannot erode the rights guaranteed by solemn treaties that both sides pledged on their honor to uphold."); United States v. Washington, 384 F. Supp. 312, 357, 402 (W.D. Wash. 1974) (recognizing that "[t]he treaty tribes may utilize improvements in traditional fishing techniques, methods and gear"); Northwest Indian Fisheries Commission, *Makah Whaling: Questions and Answers* (visited Oct. 6, 1998) <http://www.nwifc.wa.gov/whaling> (discussing planned use of traditional cedar canoes, a harpoon, and a .50 caliber rifle in a whale hunt). *But c.f.* L. Amede Obiora, *Bridges and Barricades: Rethinking Polemics and Intransigence in the Campaign Against Female Circumcision*, 47 CASE W. RES. L. REV. 275, 282 (1997) (warning that "[m]ulticulturalism can be based on a static, ahistorical concept of 'ethnic culture' [that] . . . feeds off assumptions of monolithic communities and incorporate stereotypes about cultures").

292. *See* Anaya, *supra* note 105, at 225-26.

293. This is so, according to S. James Anaya, at least to the extent that "there is some significant difference between its cultural attributes and those of the larger or dominant population." Anaya, *supra* note 105, at 224.

crucial—some kinds of costs may not be tolerable, while others may be countenanced. Respect for the cultural integrity of the peoples of the Pacific Northwest requires sensitivity to the importance placed by these peoples on fish and fishing, even if this respect entails some costs to members of the dominant society. However, here the costs to members of the dominant society are likely not to infringe upon their important interests.

Because of the importance of fish, fishing and fish consumption to the cultural integrity of Native peoples of the Pacific Northwest, we should evaluate the claim of this group to health and environmental protection differently from the claim of say, a fishing club or, perhaps more to the point, a grouping of recreational fishers. In order to respect the cultural integrity of the Tulalip, the Yakama, and other Native peoples, we therefore need to attend to their different claims, and to the different role of fish, fishing and fish consumption in their culture—broadly understood in its religious, linguistic, aesthetic, political, economic and other social spheres.

Remediation of exclusionary and cultural discrimination. The second ground for differential treatment of Native American claims is equality. The pursuit of equality in many instances requires us to consider the particular history and circumstances of ethnocultural groups. When members of a group have suffered discrimination precisely because of their distinctive ethnocultural or racial attributes, measures to remedy the discrimination are justified, and indeed required. Note that historical discrimination may have both past and continuing effects, both of which must be affirmatively counteracted. Moreover, groups' different histories have been accompanied by different kinds and mixes of discrimination that must be taken into account. Professor Anaya has identified two types of such discrimination—*exclusionary discrimination* and *cultural discrimination.*[294]

Exclusionary discrimination involves impeding group members' full realization of the benefits and privileges commonly enjoyed by members of majority or dominant groups, or imposing burdens not suffered by the majority or dominant society. Often, members of minority or nondominant groups suffer impediments or limitations precisely because of their identity as group members, e.g., because of the groups' distinctive cultural, racial or ethnic at-

294. Anaya, *supra* note 105, at 227-29.

tributes.[295] Discrimination of this sort might also involve efforts to exclude some groups from full participation in societal decision making, even as those excluded bear the brunt of decisions made in the forum that excludes them. In the United States, the past and continuing experience of African-Americans provides a prominent example of exclusionary discrimination, but other groups have also been subject to this sort of discrimination, including Japanese-Americans, Native-Americans, and women (on the basis of gender).[296]

Exclusionary discrimination is widely viewed as problematic. It is not consonant with well-settled norms in the United States and elsewhere; it serves as the justification for many familiar efforts to address inequality. The understanding of discrimination as exclusion drives various positive expressions of these norms, including the Equal Protection Clause of the United States Constitution and civil rights legislation. There is, moreover, an emerging consensus that this sort of discrimination can result in inequalities in the distribution of risks from environmental harms.[297]

This type of inequality typically requires remedies designed to allow members of minority or subordinated groups to do those things which members of the majority or dominant group can do already. Realization of equality, on this view, may in some instances require society to honor claims to "assistance rights"—spe-

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295. *See, e.g., id.* at 227.

296. *See, e.g., id.* ("[Exclusionary discrimination] is manifested prominently in the experience of black Americans, who initially found themselves within the U.S. polity as slaves and who, even after emancipation, were denied rights of citizenship and access to social benefits on an equal basis with the dominant white population.").

297. Thanks to the work of community activists, environmental injustice can no longer be ignored by governmental or even private entities. In 1992, for example, an EPA Environmental Equity Workgroup published a report to the administrator stating that "the relative risk borne by low-income and racial minority communities is a special concern," and concluding that these populations "experience higher than average exposures to selected air pollutants, hazardous waste facilities, contaminated fish, and agricultural pesticides in the workplace." 1 ENVIRONMENTAL EQUITY WORKGROUP, U.S. ENVTL. PROTECTION AGENCY, ENVIRONMENTAL EQUITY: REDUCING RISK FOR ALL COMMUNITIES, WORKGROUP REPORT TO THE ADMINISTRATOR 3 (1992). *See generally* ENVIRONMENTAL EQUITY WORKGROUP, U.S. ENVTL. PROTECTION AGENCY, ENVIRONMENTAL EQUITY: REDUCING RISK FOR ALL COMMUNITIES, SUPPORTING DOCUMENT (1992). *But cf.* Robert D. Bullard, *Conclusion: Environmentalism with Justice, in* CONFRONTING ENVIRONMENTAL RACISM: VOICES FROM THE GRASSROOTS 195, 195-201 (Robert D. Bullard ed., 1993) (criticizing EPA's report as a public relations ploy that fails in numerous instances to consider the evidence, particularly that presented by grassroots advocates). In 1994, President Clinton issued an Executive Order specifically addressing environmental justice: Exec. Order No. 12,898, 3 C.F.R. § 859 (1995), *reprinted in* 42 U.S.C. § 4321 (1994).

cial provisions to enable a minority or subordinated group to overcome obstacles to engaging in common practices.[298] These provisions are likely to impose some sort of cost on the majority society. But these costs are arguably outweighed by the injustice that would result were the subordinated group denied access to the activities in question.[299] This argument is strengthened by the recognition that beyond being *common* things that members of the majority group can already do, in many cases, these are *important* things that members of the majority can already do. Indeed, it seems that the more important the activities at issue, the stronger the claim to a remedy, even if there are attendant costs.

This strain of discrimination and the claims to equality that flow from it help illuminate some specific aspects of the case at hand. Native American groups have a claim to the full realization of the benefits ordinarily enjoyed by members of majority or dominant groups. The majority—or those who consume fish in line with the dominant culture's practices—already enjoys a level of public health benefits, i.e. protection from risk in excess of 1 in 1,000,000 at a descriptive FCR. Members of the subordinated culture seek only to realize the benefits ordinarily enjoyed by the majority. However, the benefits of state health and environmental protection are distributed such that only the dominant society can safely engage in the common but vital activity of eating fish. These benefits should also be dispensed so as to enable subordinated groups to engage in this common, vital activity.

The subordinated group should not be made to suffer some version of "lower yet adequate" protection. Recall that the Ninth Circuit in *Dioxin/Organochlorine Center* cited approvingly EPA's argument that "the one-in-a-million risk level mandated by state water quality standards for the general population does not necessarily reflect state legislative intent to provide the highest level of protection for all subpopulations but could reasonably be construed to allow for lower yet adequate protection for specific subpopulations."[300] The discriminatory reading implicit in the court's argument is that the legislature, in stipulating a risk level of $1(10^{-6})$, meant $1(10^{-6})$ only for non-Indians and meant to allow higher levels for the Tulalip, the Yakama, and the Umatilla. Even assuming that the court in *Dioxin/Organochlorine Center* fairly represented

298. Levy, *supra* note 273, at 29-32; *see supra* note 276 and accompanying text.

299. Levy, *supra* note 273, at 29-30.

300. Dioxin/Organochlorine Center v. Clarke, 57 F.3d 1517, 1524 (9th Cir. 1995).

agencies' and courts' approval for a range of risks in all regulatory contexts, it is not fair to represent this as societal approval for sorting within this range according to identifiable subpopulation, especially where the identifiable subpopulation is one that might be recognized as having legitimate claims rooted in equality. In particular, it is difficult to imagine an apology for EPA's construction that is consistent with the understandings of what equality requires with respect to Native Americans. Once the identity of the subpopulation getting "lower yet adequate" protection became apparent to EPA, arguments that might have been plausible in the absence of identifiability are no longer valid.[301] Tradeoffs that might have been appropriate for EPA to consider with respect to even other higher-consuming subpopulations, say recreational fishers, become inappropriate here.

Discrimination of a different sort, cultural discrimination, works to suppress or obliterate cultural bonds, by stifling expression of nondominant or minority groups' cultures. Often this practice is sustained on the premise that the dominant or majority culture is superior.[302] This type of discrimination involves efforts by the dominant society to acculturate or assimilate the subordinated group without their consent, and where abandonment of the group's cultural identity is not internally desired.[303] The absence of consent or a desire to be assimilated sets groups like Native peoples apart from immigrant groups that "have in some way consented to subordinate their cultural expressions to those predominating in the receiving society."[304] The experience of Native Americans in the United States provides a clear and prominent example of this sort of discrimination.[305] By definition, Native Americans are not immigrants, and so could not be said to have given even tacit consent to the suppression of their cultural identity.[306] Yet there is an undeniable history of efforts to colonize,

301. Recall, for example, the argument that *if* the identity of the subpopulation getting "lower" protection were not known or knowable, then everyone in the entire population has, in theory, an equal chance of being the one protected to a level of $1(10^{-6})$ and of being the one protected only to a level of $2.3(10^{-5})$. *See supra* notes 236-237 and accompanying text.

302. *See* Anaya, *supra* note 105, at 228.

303. *Id.*

304. *Id.*

305. *See* GETCHES ET AL., *supra* note 30, at 41-72; Anaya, *supra* note 105, at 228-29.

306. *See* Anaya, *supra* note 105, at 228-29.

exterminate, and assimilate them;[307] these efforts have profound past and continuing effects.[308] Notably, these efforts have often been aimed at denying or denigrating the land- and resource-based facets of Native Americans' cultures.[309]

Cultural discrimination is increasingly understood to be a problem; it is not consonant with recognized norms in the United States and elsewhere. The understanding of discrimination as cultural suppression arguably fuels various positive expressions of these norms with respect to Native Americans in the United States. For example, the EPA's regulations implementing Title VI of the Civil Rights Act of 1964 might plausibly be understood to include some sensitivity to the different bases for Native Americans' claim to equality and, specifically, to the role played by cultural discrimination. The EPA regulations define "American Indian or Alaskan native" as "[a] person having origins in any of the original peoples of North America, *and who maintains cultural identification* through tribal affiliation or community recognition."[310] Moreover, an understanding of discrimination as cultural suppression may undergird recent governmental cognizance of environmental injustice. President Clinton's Executive Order on Environmental Justice, for example, singles out for agency attention the differential circumstances of subsistence populations with respect to fish consumption.[311]

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307. *See generally* ROBERT A. WILLIAMS, JR., THE AMERICAN INDIAN IN WESTERN LEGAL THOUGHT: THE DISCOURSES OF CONQUEST (1990).

308. *See, e.g.*, Anaya, *supra* note 105, at 229 ("The cultural suffocation historically experienced by Native Americans . . . along with other multiple effects of colonialism, have left [them] with deep wounds which manifest themselves in social, political, economic, as well as cultural spheres.").

309. *See, e.g., id.* at 228-29; *Growth of Gambling on Tribal Land Starts Trek Back Home by Indians*, N.Y. TIMES, Jan. 17, 1999, at A10.

310. 40 C.F.R. § 7.25 (1984) (emphasis added). Although the EPA regulations include "American Indian or Alaskan native" among the enumerated ethnic/racial groups covered by the prohibition on discrimination "on the basis of race, color, national origin or, if applicable, sex," this does not necessarily mean that there is an identical basis for recognizing the claims of each of these sorts of groups. The inclusion of sex discrimination on explicitly different terms ("if applicable") provides further evidence for the understanding of the varied bases for a claim to equality under Title VI that I suggest. The Equal Protection Clause might be understood to be sensitive to the different bases for Native Americans' claim to equality, but the Supreme Court, especially, has given a complex and evasive read to the matter. *See, e.g.*, Morton v. Mancari, 417 U.S. 535 (1974). *See generally* Carole E. Goldberg-Ambrose, *Not "Strictly" Racial: A Response to "Indians as Peoples"*, 39 UCLA L. REV. 169 (1991); David C. Williams, *Sometimes Suspect: A Response to Professor Goldberg-Ambrose*, 39 UCLA L. REV. 191 (1991).

311. *See* Exec. Order No. 12,898 (1995).

Cultural discrimination may require several different remedies. Among these is a claim akin to what Professor Levy terms "exemption rights"—claims by the subordinated culture to be treated differently or exempted from considerations applicable to the majority culture, in order for members of the subordinated culture to be able to exercise cultural rights and to carry out cultural duties. Claims for redress might legitimately include other rights as well.[312] In any event, as Professor Anaya argues, "As indigenous peoples now seek to rebuild their communities and cultures and to recapture their destinies, usually within the framework of the [nation-states] in which they live, their claim for remedial measures is strong."[313]

This second strain of the equality justification further illuminates the case at hand. Remedying cultural discrimination against Native Americans of the Pacific Northwest will require agencies to acknowledge and address the double bind that is imposed when risk assessors use fish consumption data that is not descriptive of Native Americans' fish consumption practices. Agencies must recognize that a ready, unproblematic metric for dietary substitutions does not exist, and that contaminated fish do not just occasion nutritional deficiencies (although they do this too), but also result in cultural suppression of Native Americans, with attendant effects in economic, social, religious, political, linguistic and other spheres. This recognition provides the rest of the response to the question arguably begged by the formulation above, i.e., members of the subordinated culture seek only to realize the benefits ordinarily enjoyed by the majority, that is, protection from risk in excess of 1 in 1,000,000 *at a descriptive FCR.* The stipulation that agencies protect each group at its own descriptive FCR is necessary, particularly in the case of the Native peoples of the Pacific Northwest, to avoid cultural discrimination.[314]

Additionally, what constitutes "a descriptive FCR" can only be determined *by* the affected people, because they are the only ones in the position to judge the question.[315] Just as the representatives

312. *See* Levy, *supra* note 273, at 25-29.

313. Anaya, *supra* note 105, at 229.

314. Although this discussion is focused on fish consumption rates, the arguments are applicable to all of the factors that go into representing this group's fish consumption practices in a risk assessment. For example, agencies must attend to the need to remedy cultural discrimination as they make the various judgment calls that go into selecting an FCR, as well as a bioaccumulation or bioconcentration factor.

315. *See, e.g.*, CRITFC Comments, *supra* note 1, at 8.

of the majority culture may appropriately determine that a descriptive FCR for the general population is one that affords protection to the practices of the 90th percentile of the CSFII study, so a Native American tribe may determine that a descriptive FCR is one that affords protection to the practices of its members. Indeed, a tribe might appropriately determine that, in order to exercise their cultural rights and carry out their cultural duties, it is necessary to ensure protection of those tribal members consuming fish at the very highest rates—to determine that it is *especially* important to ensure protection of these individuals.[316]

Remedying cultural discrimination also means understanding that the claims of Native Americans have different origins than those of other higher-consuming groups, including groups that have been subject chiefly to exclusionary discrimination. Although these groups' legitimate equality interests may indeed warrant differential responses by health and environmental agencies, the bases for and implications of their claims will often be different than those of Native Americans' claims. Many of the considerations that bear on Native American subpopulations will simply be inapplicable, even to other higher-consuming ethnocultural groups. In particular, other groups will not share the justification for remedial measures originating in the suppression of the fishing cultures of some Native American groups. Thus, when agencies think about how to respond to variability, it is not appropriate for them to lump together Native Americans' circumstances with those of other higher-consuming subgroups, such as African-American or Asian-American subpopulations. Yet this is exactly what EPA's 1998 Draft AWQC Revisions do in proposing one default for all "subsistence fishers/minority anglers." Although the fish-consumption patterns and different exposure circumstances of these and other minority subgroups *do* warrant particular attention by EPA and other agencies,[317] the justifications for this particular attention and

316. In its comments on EPA's Draft AWQC Revisions, CRITFC gives the example of a recent study that documents the fish consumption rate for "traditional members" of the Confederated Tribes of the Umatilla Reservation at 540 g/day, and notes that "[t]he Umatilla study represents the subset of tribal members who most closely adhere to treaty provisions." CRITFC Comments, *supra* note 1, at 8 (citing S.G. Harris and Barbara Harper, *A Native American Exposure Scenario*, 17 RISK ANALYSIS 789 (1997)). The 1994 CRITFC study documents a maximum consumption rate of 972 g/day and also documents additional findings with respect to members' ceremonial consumption of fish. As CRITFC points out, this sort of data is most appropriately interpreted by the relevant tribe, and an FCR most appropriately selected by the tribe. *Id.*

317. *See, e.g.*, West et al., *supra* note 21, at 111-12. Note that CRITFC's comments to

the responses necessitated are not the same for each of the groups.

In sum, in order to think about equality for Native Peoples in the United States, it is necessary to recognize the tandem bases for their claims to equality. Inequality stems from both exclusionary discrimination and cultural discrimination. Any attempt to ensure equality without attending to both aspects would be incomplete. Although efforts to remedy inequality thus understood will likely impose costs on members of the majority or dominant culture, these costs are outweighed by what is at stake. Agencies regularly countenance tradeoffs, permitting incremental decreases in environmental and health protections in order to avoid consequent increases in the regulatory costs. These tradeoffs are arguably appropriate where the subpopulation whose health is thereby compromised, e.g., recreational fishers, has no particular claim to differential attention based on the past and continuing effects of exclusionary or cultural discrimination, or based on a cultural attachment to (rather than nutritional preference or other predilection for) fish and fishing. Where, as here, these claims are apposite, such tradeoffs become inappropriate.

Ensuring just process. Finally, differential treatment for Native Americans is warranted to ensure the claims of these groups to just or due process. Two aspects of this claim are especially salient here. First, members of a minority or subordinated group have a legitimate claim that they ought not be made to bear the brunt of decisions made in a forum that systematically excludes them. Second, there is a normative claim that a majority or dominant group should not be able to speak for a culturally different minority or subordinated group, a claim that might be captured by an anti-paternalism principle. Together, these arguments should inform thinking about process where the interests of Native American groups are at stake.

The first concern is sometimes framed as the more familiar claim for "meaningful participation" by a minority or subordinated group in decision making that affects their legitimate interests. Norms favoring just or due process are widely held and well integrated into the legal fabric of many societies, including the United

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the EPA suggest not only that EPA consult tribal policy leaders to determine the FCR based on tribal data, but also that EPA take this approach "for local studies on other subsistence and highly exposed groups." CRITFC Comments, *supra* note 1, at 8.

States.[318] But it is important in the case of Native Americans to recognize the ways in which this first claim may be different than claims for participation made by other stakeholders and even by other minority groups. The claim here is not solely one that inclusion would remedy; it does not originate in a desire to be brought into the fold.[319] Rather, it is important to note the additional dimensions introduced by the fact of cultural difference. What is necessary here is more than simply the inclusion of Native Americans in a process already cast by the majority or dominant culture.[320] The entire process itself might need to be recast in order not to suppress or transform Native Americans' different cultural experiences.

The second claim that a majority or dominant group should not be able to speak for a culturally different minority or subordinated group is necessitated in the United States by a history and practice of cultural suppression, rooted in a conviction that anglo-european culture, being civilized and Christian, was superior to native peoples' cultures, being savage and heathen.[321] From these repugnant notions sprang the edict that it was the right and duty of the anglo-european culture to impose its views on and subordinate native cultures, and to "look out for" them because they could not look out for themselves. The profound impact of these justifications and practices on Native peoples continues today.

This second basis for a claim to process also colors norms accepted in the United States and elsewhere. It is difficult to imagine what measures would be required in order to prevent the dominant society from speaking for culturally distinct Native Americans in the context at hand. Part of the difficulty stems from the fact that the process has indeed been cast, and it takes place in the agencies, if not the courts, of the conqueror.[322] However, certain prominent features of the process stand out as working against this

318. In the case of the United States, see, for example, U.S. CONST. amends. V, XIV. In the case of tribes, see, for example, Colville Confederated Tribes v. Wiley, No. 94-17260, 23 INDIAN L. REP. 6037, at n.4 (Colv. Tr. Ct. Jan. 31, 1996); Frank Pommersheim, *Tribal Court Jurisprudence: A Snapshot from the Field*, 21 VT. L. REV. 7, 43 (1996).

319. Anaya, *supra* note 105, at 228 (noting that efforts to enhance the participation of minorities in the larger society are often accompanied by cultural discrimination).

320. *See* Gauna, *supra* note 102, at 13-16.

321. *See generally*, WILLIAMS, *supra* note 307.

322. *See* Johnson v. M'Intosh, 21 U.S. (8 Wheat.) 543, 588 (1823) ("Conquest gives a title which the Courts of the conqueror cannot deny . . . ."); *see also* Williams, *supra* note 25, at 293-94.

goal. The use of QRA as a decisional tool, among other things, might thwart this goal.[323] As noted above, to the extent that QRA imposes a particular epistemology, and to the extent that Native Americans' experiences are only heard by agencies and courts if they are framed according to the cultural understandings of the majority, cultural discrimination is perpetuated and just process denied.

As a pragmatic matter, some Native American tribes have sought meaningful participation or interaction in environmental decision-making processes at the state and federal levels. These tribes have sought to have a voice in decisions that affect them. Of course any understanding of tribes' legitimate claims in this regard must begin by recognizing that tribes are sovereign governments. Recent executive commitments have formalized the federal government's understanding that, because tribes are sovereign governments, participation and interaction must occur in a manner befitting a government-to-government relationship. Cognizance of the particular justifications for Native Americans' claims to process should inform all agencies' thinking about their interaction with tribes.

I have set forth some of the normative dimensions of Native American groups' claims to differential treatment by health and environmental agencies. The value that we attach to just process, cultural integrity, and equality justifies special attention to the particular case of Native Americans, including those of the Pacific Northwest. I turn next to the doctrinal dimensions of the claims of these groups to differential consideration by health and environmental agencies, and argue that agencies are legally bound by these legal obligations to provide differential treatment. Important among the relevant sources of law for the first peoples of the Pacific Northwest are treaties with the United States, the federal government's trust responsibility, and Title VI of the Civil Rights Act of 1964. In particular, the treaty and trust obligations must be understood to provide the legal framework *within which* environmental agencies' decisions—including those decisions employing QRA as a tool—take place, rather than the other way around.

2. *Doctrinal Dimensions: Treaties, Trust, and Title VI.*

The claims of indigenous peoples in the United States are dif-

323. CRITFC Comments, *supra* note 1, at 2-3.

ferent than the claims of other groups because, in many instances, they are governed by treaties, the federal trust responsibility, and Title VI. Specifically, treaties in many cases constrain important aspects of the relationship between the state and Native American tribes. For the Pacific Northwest tribes, the Stevens-Palmer treaties speak directly to the tribes' right to continue to fish as they had. The trust obligation, on contemporary understandings, requires a heightened attention by the federal government to the values of cultural integrity and self-determination of Native Peoples within the United States. The trust obligation applies to treaty and non-treaty Native Americans alike and it operates in the interstices of treaties and other laws, including environmental laws, to impose on federal government the highest duty of good faith. Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color or national origin in programs, including state environmental programs, receiving federal financial assistance. Under EPA's regulations implementing Title VI, the relevant states are prohibited from using criteria or methods of administering their environmental programs which have the effect of subjecting American Indians to discrimination or impairing the objectives of their programs with respect to American Indians. Together, these three doctrinal sources constrain in important and unique ways health and environmental agencies' decisions affecting Indians and their resources.[324]

Treaties between First Nations and the United States. In many cases, treaties between American Indian nations and the United States impose relevant legal obligations on both federal and state environmental agencies. Such treaties are recognized as binding legal documents under the law of nations, under United States constitutional law, and under the legal systems of the Native nations.[325] According to United States constitutional law, treaties—

324. This treatment is limited; it does not exhaust the relevant sources of law that might bear on agency action here. Notably, it excludes obligations under the Equal Protection Clause of the United States Constitution and under various international legal commitments. With respect to the latter, see generally S. JAMES ANAYA, INDIGENOUS PEOPLES IN INTERNATIONAL LAW (1996).

325. *See generally*, FRANCIS PAUL PRUCHA, AMERICAN INDIANS TREATIES: THE HISTORY OF A POLITICAL ANOMALY (1994); ROBERT A. WILLIAMS, LINKING ARMS TOGETHER: AMERICAN INDIAN TREATY VISIONS OF LAW AND PEACE, 1600-1800 (1997); S. James Anaya, *In the Supreme Court of the American Indian Nations Lone Wolf, Principal Chief of the Kiowas, et al.*, 7 WTR KAN. J.L. PUB. POL'Y 117, 129-31 (1997); *cf.* FRANCIS PAUL PRUCHA, AMERICAN INDIANS TREATIES: THE HISTORY OF A POLITICAL ANOMALY (1994).

including Indian treaties—are the supreme law of the land.[326] According to the laws of the Native nations that entered into treaties with the United States and its colonial predecessors, treaties "were typically regarded as foundational texts of lasting juridical significance for ongoing relations among diverse peoples, and continue to be regarded as such."[327] On both understandings, a principal attribute of treaties is their binding character, such that material terms of the agreement may not be unilaterally abrogated.[328] Similarly, on both understandings, a concept implicit in treaties and treaty-making is that described by the maxim *pacta sunt servanda*—which is to say, parties to a treaty implicitly covenant to keep their word and to adhere to the agreement in good faith.[329]

For many American Indian nations in the Pacific Northwest, treaties speak to relevant aspects of their historical and ongoing relations with the United States. These treaties, collectively referred to as the Stevens-Palmer treaties, support an interpretation that not only recognizes Indians' reservation of their right to take fish "at all usual and accustomed grounds and stations," but also includes some guarantee that there be fish for taking (and consuming), that is, that the fishery habitat be protected from degradation or contamination. The Treaty of Medicine Creek, between the United States and various Puget Sound tribes, for example, provides "[t]he right of taking fish, at all usual and accustomed grounds and stations, is further secured to said Indians, in common with all citizens of the Territory."[330] Other 1854-55 treaties include virtually identical language.[331]

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326. The President, with the advice and consent of the Senate, has the power to make treaties. U.S. CONST. art. II, § 2, cl. 2. Under the Supremacy Clause, treaties are superior to any conflicting state laws. U.S. CONST. art. IV, cl. 2.; *see, e.g.*, Worcester v. Georgia, 31 U.S. (6 Pet.) 515, 518 (1832).

327. Anaya, *supra* note 325, at 130; *see also* Frank Pommersheim, *Representing Native People and Indian Tribes: A Response to Professor Allegretti*, 66 FORDHAM L. REV. 1181, 1183 (1998).

328. *See, e.g.*, IAN BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 616 (4th ed. 1990); Anaya, *supra* note 325, at 130.

329. *See* Anaya, *supra* note 325, at 130-31.

330. Treaty with the Nisquallys (Medicine Creek Treaty), Dec. 26, 1854, U.S.-Nisquallys, art. III, 10 Stat. 1132 (1855). Indian parties included the Nisquallys, Puyallup, Steilacoom, Squawksin, S'homamish, Steh-chass, T'Peeksin, Squi-aitl, and Saheh-wamish. *See id.*

331. Treaty with the Duwamish, Jan. 22, 1855, U.S.-Duwamish, art. V, 12 Stat. 927 (1859); Treaty with the S'klallams, Jan. 26, 1855, U.S.-S'klallams, art. IV, 12 Stat. 933 (1859); Treaty with the Makah, Jan. 31, 1855, U.S.-Makah, art. IV, 12 Stat. 939 (1859); Treaty with the Yakimas, June 9, 1855, U.S.-Yakimas, art. III, para. 2, 12 Stat. 951 (1859); Treaty with the Walla Walla, June 9, 1855, U.S.-Walla Walla, art. I, 12 Stat. 945 (1859);

By the early 1900s, however, the United States Supreme Court had already had to address encroachments on this treaty-guaranteed right to take fish, ruling that neither private parties nor state regulation could exclude Indians from harvesting a share of fish at their usual and accustomed fishing areas.[332] In the 1970s district court Judge George Boldt found in *United States v. Washington*[333] that, among other things, the tribes' express reservation of fishing rights recorded in these treaties included the right to share equally with non-treaty fishers "the opportunity to take fish at 'usual and accustomed grounds and stations.'"[334] Judge Boldt issued this opinion after more than three years of intensive study had revealed an erosion of Indian fishing rights by state regulation and by various sources of non-Indian encroachment.[335] Among the important and foundational principles enunciated by Judge Boldt is that American Indians' fishing rights *differ* from those of other citizens because of the treaties.[336] Judge Boldt also affirmed the importance of fish to the Indians and recognized the treaties' role in securing the place of fish and fishing in the lives of the treaty tribes. The court noted that "[t]he evidence shows beyond doubt that at treaty time the opportunity to take fish for personal subsistence and religious ceremonies was the single matter of utmost

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Treaty with the Nez Perce, June 11, 1855, U.S.-Nez Perce, art. III, para. 2, 12 Stat. 957 (1859); Treaty with the Tribes of the Middle Oregon, June 25, 1855, U.S.-Tribes of the Middle Oregon, art. I, para. 3, 12 Stat. 963 (1859); Treaty with the Qui-nai-elts, July 1, 1855-Jan. 25, 1856, U.S.-Qui-nai-elts, art. III, 12 Stat. 971 (1859). *See generally* PRUCHA, *supra* note 325, at 250-55, & App. B.

332. United States v. Winans, 198 U.S. 371 (1905). In *Winans*, the Court ruled that the treaty language guaranteed to the Indians an implied right of access across private lands to reach treaty fisheries, and also prohibited an arrangement where non-Indians used state-licensed fishing wheels that prevented Indian treaty fishers from harvesting a share of fish at their usual and accustomed fish stations. The *Winans* Court also enunciated a crucial principle for understanding the Stevens and other treaties: that they were "not a grant of rights to the Indians, but a grant of rights from them—a reservation of those not granted." *Id.* at 381. For a recent recapitulation of courts' interpretation of Indian fishing rights under the Stevens treaties, see Allen H. Sanders, *Damaging Indian Treaty Fisheries: A Violation of Tribal Property Rights?*, 17 PUB. LAND & RESOURCES L. REV. 153, 154-59 (1996).

333. 384 F. Supp. 312 (W.D. Wash. 1974).

334. *Id.* at 343; *see also* Sohappy v. Smith, 302 F.Supp. 899 (D. Or. 1969).

335. *See* PRUCHA, *supra* note 325, at 404.

336. *Id.*; *see also* Washington v. Washington Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658, 678-79 (1979) (holding that treaty language securing a "right of taking fish . . . in common with all citizens of the Territory" was not intended merely to guarantee Indians access to their usual and accustomed fishing sites and an "equal opportunity" for individual Indians, along with non-Indians, "to try and catch fish").

concern to all treaty tribes and their members."[337]

Courts construing Indian treaty-secured fishing rights have supplied additional interpretations relevant to health and environmental agency standard setting. Courts have emphasized that treaty-protected rights to fish cannot be "balanced away" by competing interests or concerns.[338] As held in United States v. Michigan, these rights "may not be qualified by any action of the state."[339]

Moreover, in the second phase of *United States v. Washington*[340] the district court, in an opinion that was vacated on other grounds, held that "implicitly incorporated in the treaties' fishing clause is the right to have the fishery habitat protected from man-made despoilation . . . . The most fundamental prerequisite to exercising the right to take fish is the existence of fish to be taken."[341] While the vacated opinion has no precedential force, the logic behind the court's interpretation remains unassailable.[342] Other courts have since found that the treaty-secured right to take fish requires ensuring certain ecological conditions necessary to support the fish.[343]

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337. United States v. Washington, 384 F. Supp. 312, 343 (W.D. Wash. 1974). *But cf. Fishing Vessel Ass'n*, 443 U.S. at 688-89.

338. *See* Cappaert v. United States, 426 U.S. 128, 138-39 (1976); United States v. Adair, 723 F.2d 1394, 1413 (9th Cir. 1983); Swim v. Bergland, 696 F.2d 712, 717-18 (9th Cir. 1983); New Mexico v. Aamodlt, 537 F.2d 1102, 1113 (10th Cir. 1976); *see also* United States v. Michigan, 471 F. Supp. 192, 281 (W.D. Mich., 1979) ("[T]he right of the . . . tribes to fish in ceded waters of the Great Lakes is . . . distinct from the rights and privileges held by non-Indians and may not be qualified by any action of the state . . . except as authorized by Congress."). *Accord,* United States Department of the Interior, Office of the Solicitor, Memorandum from Michael J. Anderson, Associate Solicitor, Division of Indian Affairs, Subject: Indian Treaty Hunting and Fishing Rights and the Endangered Species Act (Nov. 8, 1994) ("Acknowledgment that treaty rights are to receive the highest protection possible leads to the conclusion that non-treaty impacts on treaty resources must be minimized to permit the fulfillment of treaty promises." (citing United States v. Winans, 198 U.S. 371, 381 (1905)).

339. *See, e.g., United States v. Michigan*, 471 F. Supp. at 281.

340. United States v. Washington, 506 F. Supp. 187 (W.D. Wash. 1980) (Phase II) *vacated by* United States v. Washington, 759 F.2d 1353 (9th Cir. 1985).

341. *Id.* at 203. *See generally* Peter C. Monson, United States v. Washington (Phase II): *The Indian Fishing Conflict Moves Upstream*, 12 ENVTL. L. 469 (1982).

342. *Cf.* CRITFC Comments, *supra* note 1, at 1-2, 4 (noting that courts have concluded that "the treaty right to take fish would be meaningless if the fish resource were permitted to diminish because of industrial development and pollution"); Sanders, *supra* note 332, at 167-71 (noting that "[t]he argument for an implied treaty right of habitat protection draws upon the special rules of Indian treaty construction and the historical evidence . . . that they would always be able to rely on their fisheries for their economic, subsistence, and cultural needs . . . .").

343. *See, e.g.*, Kittitas Reclamation District v. Sunnyside Valley Irrigation District, 763

The Stevens-Palmer treaties, so interpreted, should be understood to constrain environmental agencies' standard-setting.[344] Where federal or state[345] agencies[346] use quantitative risk assessment and rely on fish consumption rates and other exposure factors that underestimate Native Americans' exposure, they arguably permit contaminant levels in excess of levels that would adequately support the tribes' treaty-protected right to take fish. The EPA in its Draft Ambient Water Quality Criteria Methodology Revisions notes the applicability of "tribal rights under federal law (e.g., fishing, hunting and gathering rights)" to agencies' determination of fish consumption rates and other exposure factors affecting waters supporting, inter alia, treaty-protected fisheries.[347] "Federal law" here presumably is meant to include Indian treaties, although it is remarkable that EPA nowhere specifically refers to its treaty obligations. Nor does EPA elaborate its understanding of the implications of such "tribal [fishing] rights under federal law."

Given that a treaty right is implicated, it is not appropriate to lump together for treatment Indians and non-Indians.[348] Moreover, although agencies may ordinarily attempt to balance competing considerations, e.g., trading off increased protection of human health against the monetary costs of such increase, agencies cannot balance away American Indians' treaty-protected fishing rights. Finally, agencies should keep in mind the implied covenant of good

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F.2d 1032 (9th Cir. 1985) (upholding district court's order authorizing the watermaster to ensure sufficient water flow for the protection of salmon nests within the Yakima River system, because it was necessary to protect the Yakima Nation's treaty-secured fishing rights under one of the Stevens-Palmer treaties); United States v. Adair, 723 F.2d 1394 (9th Cir. 1984) (finding that Indians are entitled to the water necessary to protect their treaty-secured fishing rights).

344. *Cf.* CRITFC Comments, *supra* note 1, at 1-2, 4 (arguing that courts have directed agencies to exercise their authority in a manner that will protect, rather than degrade, treaty-protected fish habitat).

345. Treaties entered into by the United States are binding on both federal and state governments. *See* U.S. CONST. art. VI; Worcester v. Georgia, 31 U.S. (6 Pet.) 515, 560-61 (1832) (declaring void a Georgia statute that purported to alter a treaty right of the Cherokee Nation).

346. It is well-established that agencies can neither violate nor abrogate treaty rights. *See* FELIX S. COHEN, HANDBOOK OF FEDERAL INDIAN LAW, 217-28 (Rennard Strickland et al. eds., 3d ed. 1982).

347. "EPA further notes that risk levels and criteria need to be protective of tribal rights under federal laws (e.g., fishing, hunting and gathering rights) that are related to water quality. Subrights may raise unique issues and will need to be evaluated on a case-by-case basis." Draft AWQC Revisions, *supra* note 38, at 43,773.

348. *See, e.g.*, Department of Interior Memorandum, *supra* note 338, at 8 (arguing against lumping assessment of Indian and non-Indian activity, where treaty rights are implicated, in context of fishing and hunting rights and the Endangered Species Act).

faith when they exercise discretion or make the many judgments required by QRA. In order to uphold the Stevens-Palmer and other treaties—which agencies are bound to do—agencies should ensure that the effect of their many judgments is to sustain Native American nations' treaty-protected rights to take fish.

The federal trust responsibility. The federal trust responsibility imposes on the federal government a set of obligations that, properly understood, require environmental laws to be interpreted and environmental standards to be set in a manner protective of Native American property, resources, and culture. The trust responsibility is a substantive elaboration of the standard of conduct for the federal government vis à vis Native American tribes and individuals;[349] as such, it is one of the "cornerstones" of federal Indian law.[350] The duty imposed is that of the "most exacting fiduciary."[351] The trust responsibility binds federal administrative agencies, including the EPA and other agencies that regulate human health and the environment. It requires that federal action with respect to treaties, agreements, statutes, executive orders, and administrative regulations, be "construed in light of the trust responsibility."[352] Because the trust responsibility exists independent of and in addition to treaty obligations, its applicability is not limited to treaty tribes.[353] According to contemporary understanding, the object of the trust relationship is furtherance of American Indian self-determination and cultural integrity.[354] Mary Christina Wood has argued further that tribal sovereignty and a viable Native separatism should serve as the benchmarks for measuring the trust responsibility.[355] She identifies four attributes of sovereignty that "warrant protection as beneficiary interests under the trust doctrine: (1) a stable, separate land base; (2) a viable tribal economy; (3) self-government; and (4) cultural vitality" and should thus serve as focal

349. *See generally* Mary Christina Wood, *Fulfilling the Executive's Trust Responsibility Toward the Native Nations on Environmental Issues: A Partial Critique of the Clinton Administration's Promises and Performance*, 25 ENVTL. L. 733 (1995) [hereinafter Wood, *Native Nations*]; Mary Christina Wood, *Indian Land and the Promise of Native Sovereignty: The Trust Doctrine Revisited*, 1994 UTAH L. REV. 1471 [hereinafter Wood, *Indian Land*]; Wood, *supra* note 263.

350. *See* COHEN, *supra* note 346, at 221.

351. *Id.* at 226 (quoting Seminole Nation v. United States, 316 U.S. 286, 297 (1942)).

352. COHEN, *supra* note 346, at 220-21.

353. *See, e.g.*, Wood, *Native Nations*, *supra* note 349, at 742.

354. *See, e.g.*, Anaya, *supra* note 325, at 131-34; D. Williams, *Indians as Peoples*, *supra* note 285, at 843.

355. *See* Wood, *Indian Lands*, *supra* note 349, at 126-33.

points for trust analysis.[356]

Although in the past the United States Supreme Court has supported an absolutist version of the congressional plenary power over the American Indians as a corollary to the duties of trusteeship, contemporary scholarship suggests that the trust doctrine continues to exist free of its insidious racist moorings. Professor Anaya notes: "[t]he idea of a guardianship or trusteeship between the U.S. federal government and Indian nations is not itself objectionable, if the sources and objects of that relationship are adjusted to contemporary values of Indian self-determination and cultural integrity."[357] Professor Anaya then explains the derivation of the trust responsibility as "an exegesis of the course of U.S.-Indian relations and international law."[358] He points out that the normative elements of the trusteeship have changed as the dominant thinking in each of these arenas has itself changed over time.[359] Thus, he observes, norms in the international context now include contemporary conceptions of the long-recognized special duty to ensure the just treatment of indigenous peoples. Even within the United States, constitutional understandings of the trust have been rearticulated to impose some sorts of constraints—albeit limited—on the exercise of federal power vis à vis American Indians.

In the context of federal actions affecting tribal land and resources, tribal leaders and other commentators have argued that the duty imposed is an affirmative one. Ted Strong, then Executive Director of CRITFC, casts the duty as one requiring both federal *protection* of trust resources and federal *assistance* in tribes' own efforts to protect those resources:

> The United States' trust responsibility toward American Indians is the unique legal and moral duty of the United States to assist Indians in the protection of their property and rights. Too often, the federal government has construed protection to mean control . . . . In the spirit of the law, we seek federal assistance to defend against injury to our trust resources.[360]

Professor Wood similarly emphasizes that the trust obligation in

356. *Id.* at 113, 133-222.

357. Anaya, *supra* note 325, at 131.

358. *Id.* at 138; *cf.* Wood, *Native Nations*, *supra* note 349, at 742-43 (arguing that "Nearly all native peoples in the United States . . . share a common loss of land and resources to an immigrant majority population with colonialist impulses. The trust doctrine represents that measure of legal responsibility on the part of the majority society to protect what the native population retained.").

359. *See* Anaya, *supra* note 325, at 132-38.

360. Wood, *Native Nations*, *supra* note 349, at n.38 (citing *Hearings Before the Columbia*

this context includes a duty "to *protect* tribal lands, resources, and the native way of life from the intrusions of the majority society."[361]

In order to comply with trust obligations, federal environmental agencies, including the EPA, must abide by several established principles. For example, it is "well settled" that the trust responsibility applies to decisions regulating off-reservation sources and activities that impact tribal lands.[362] Further, many tribes by treaty retained property rights in off-reservation resources, such as the fishing rights retained by the tribes of the Pacific Northwest. The trust responsibility requires the EPA to protect these tribal property rights.[363] As the district court recently held in *Northwest Sea Farms v. U.S. Army Corps of Engineers*, a case involving Lummi fishing rights under the Treaty of Point Elliott, "[i]n carrying out its fiduciary duty, it is [federal agencies'] responsibility to ensure that Indian treaty rights are given *full* effect."[364]

In addition, agencies should not attempt to accommodate the general public's interests if to do so would jeopardize or compromise tribal resource rights.[365] Moreover, while the EPA is often

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River Fisheries Task Force, Columbia River Inter-Tribal Fish Commission (Oct. 28, 1992) (statement of Ted Strong, Executive Director)).

361. *Id.* at 742 (emphasis added).

362. *Id.* at 744.

363. *See id.* at 744. Donald Sampson, Chairman of the Umatilla Board of Trustees reiterates this obligation in the specific context of the several threats to the fish of the Columbia River Basin: "Each . . . federal agenc[y] ha[s] a trust responsibility to protect these resources for the tribes. And what this means is that they've got to protect and recognize the rights to fish and the right to have those fish in the streams . . . ." A Matter of Trust, *supra* note 129.

364. Northwest Sea Farms v. United States Army Corp of Engineers, 931 F. Supp. 1515, 1520 (W.D. Wash. 1996) (emphasis added).

365. Pyramid Lake Paiute Tribe of Indians v. Morton, 354 F. Supp. 252, 255-57 (D.D.C. 1972). The court found defective the Secretary of the Interior's regulation allocating water to the Truckee-Carson Irrigation District that would otherwise have flowed into Pyramid Lake, which lake was on the tribe's reservation and constituted the tribe's principal source of livelihood, among other things, because the Secretary misunderstood the obligations imposed by the trust.

> [T]he Secretary's . . . approach to the difficult problem confronting him misconceived the legal requirements that should have governed his action. . . .The Secretary's duty was not to determine a basis for allocating water between the District and the Tribe in a manner that hopefully everyone could live with . . . . [T]he tribe had asserted well-founded rights . . . . It was not [the Secretary's] function to attempt an accommodation . . . . The Secretary was obliged to formulate a closely developed regulation that would preserve water for the Tribe . . . . Difficult as this process would be, and troublesome as the repercussions of his actions might be . . . .

Id. at 256-57; *see also* CRITFC Comments, *supra* note 1, at 5 (quoting Northern Cheyenne Tribe v. Hodel, 12 INDIAN L. REP. 3065 (D. Mont. 1985)).

given considerable latitude in implementing the various environmental statutes with which it is charged, it must exercise its discretion in light of its trust obligations. "Judgment calls" resulting in a denial of Indian rights are not permissible under the trust.[366] As Professor Wood explains,

> [The] trust responsibility can be thought of as an interstitial body of law that, when applied in concert with applicable statutes, imposes on agencies a duty to protect tribal interests in carrying out general statutory mandates. . . . The trust responsibility provides a parameter to guide [agencies'] discretion when Indian rights are affected. In the environmental context, the trust obligation to protect tribal resources should often translate into a higher level of ecological protection than that which might result when solely non-Indian interests are affected.[367]

Finally, in order to fulfill its fiduciary obligations, the EPA may need to actively ensure that tribal interests are being heard and considered in decision-making processes that affect these interests.[368]

Thus, by virtue of the federal trust responsibility, federal agencies setting or approving health-based environmental standards for water and sediments on which fish—and, in turn, Native Americans—depend, have an obligation to protect higher-consuming Native American subpopulations as part of the duty to protect Native Americans' resources and way of life. This obligation requires the EPA to reevaluate standard interpretations of health and environmental statutory directives when such interpretations affect Native Americans and to employ a fish consumption rate and other exposure factors that are reflective of Native American consumption. The trust obligation further prevents federal agencies from seeking to accommodate conflicting interests affecting issues such as water quality where to do so would compromise tribal resources, including resources necessary to support treaty-secured rights to fish. In addition, agencies employing QRA to set environmental standards arguably must refrain from making a host of judgment calls that together work to deny protection of Native American rights to take and consume fish. Finally, federal agencies may need to take more affirmative steps to ensure that tribal interests are be-

366. *See, e.g., Pyramid Lake Paiute Tribe*, 354 F. Supp. at 256-57 (holding that the Secretary's judgment call "calculated to placate temporarily conflicting claims to precious water . . . was simply not legally permissible [and] . . . fail[ed] to demonstrate an adequate recognition of his fiduciary duty to the Tribe.").

367. Wood, *Native Nations*, *supra* note 349, at 743-45.

368. *See, e.g., Northwest Sea Farms*, 931 F. Supp. at 1524.

ing heard, considered, and protected; in the case of EPA, this responsibility should inform its criteria documents and other guidance, its approval of state standards, and its issuance of standards.

Together, obligations flowing from treaties and trust give rise to a legitimate claim by Native Americans of the Pacific Northwest to extraordinary consideration. Specifically, these Native Peoples can properly seek exemption from the balancing that agencies apply to other outlier subpopulations. Full recognition of treaty rights and the trust obligation means "giving full consideration to and accounting of the tribes' treaty right to take fish *and to take fish that are safe to eat.*"[369] Although that path will likely impose societal costs, these costs are exactly what the majority society in the United States should be understood as having undertaken, and should uphold in good faith.

Title VI of the Civil Rights Act of 1964. Title VI of the Civil Rights Act of 1964 prohibits state environmental agencies from administering their programs in ways that discriminate against American Indians. Specifically, it prohibits recipients of federal funds from discriminating "on the ground of race, color, or national origin."[370] Most state agencies charged with setting health and environmental standards receive federal financial assistance and thus fall within the ambit of Title VI.[371] The EPA has promulgated implementation of regulations applicable to these recipients.[372] EPA's regulations specifically include "American Indian[s]" among the covered classifications based on race, color, or national origin.[373] Although Title VI provides both administrative[374] and judi-

369. CRITFC Comments, *supra* note 1, at 5.

370. Civil Rights Act of 1964 § 601, 42 U.S.C. § 2000d (1988) ("No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.").

371. For a catalog of programs through which EPA provides financial assistance to states, see 40 C.F.R. § 7 app. A (1999).

372. 40 C.F.R. § 7 (1999).

373. *Id.* at § 7.25 (defining an "American Indian or Alaskan native" as "[a] person having origins in any of the original peoples of North American, and who maintains cultural identification through tribal affiliation or community recognition").

374. EPA has recently issued guidance outlining investigative procedures for administrative complaints challenging permits on environmental justice grounds. See United States Environmental Protection Agency, *Interim Guidance for Investigating Title VI Administrative Complaints Challenging Permits* (visited Nov. 3, 1999) <http://es.epa.gov/oeca/oej/titlevi.html>. For discussions of the advantages and disadvantages of pursuing environmen-

cial avenues for complaint, the ability of a group to bring an action to enforce agency compliance with Title VI's directives is not fully developed. The United States Supreme Court has not yet considered whether a private right of action is available under regulations implementing Title VI.[375]

In the context of general Title VI claims, the Supreme Court has to date established that Title VI itself reaches only intentional discrimination and "that actions having an unjustifiable disparate impact on minorities [can] be redressed through agency regulations designed to implement the purposes of Title VI."[376] The Third Circuit, at least, has taken this second part of the Court's statement, together with other evidence, to support an implied private right of action for private plaintiffs suing to enforce EPA regulations implementing Title VI, in which case plaintiffs need not prove discriminatory intent but need demonstrate only disparate impact.[377] This lesser showing is supported by the EPA's Title VI implementing regulations, which state, in relevant part:

> (a) As to any program or activity receiving EPA assistance, a recipient shall not . . . on the basis of race, color, national origin or, if applicable, sex . . . . (2) Provide a person any service, aid or benefit that is different, or is provided differently from that provided to others under the program . . . .[378]
>
> (b) A recipient shall not use criteria or methods of administering its program which have the effect of subjecting individuals to discrimination because of their race, color, national origin, or sex, or have the effect of defeating or substantially impairing accomplishment of the objectives of the program with respect to individuals of a particular race, color, national origin, or sex.[379]

Even if the relevant court of appeals (and, ultimately, the Supreme Court) recognizes a private right of action to enforce the EPA regulation, several questions about the contours of a plaintiff's

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tal justice through administrative complaints, see Luke W. Cole, *Civil Rights, Environmental Justice and the EPA: The Brief History of Administrative Complaints Under Title VI of the Civil Rights Act of 1964*, 9 J. ENVTL. L. & LITIG. 309 (1994); Fisher, *supra* note 26, at 313-16.

375. Although the Court had granted certiorari in a case that promised to raise these questions, *Seif v. Chester Residents Concerned for Quality Living*, 118 S.Ct. 2296 (1998) (mem.), the Court dismissed the case on plaintiff-respondents' suggestion of mootness, but ordered that the Third Circuit decision be vacated, 119 S. Ct. 22 (1998).

376. Alexander v. Choate, 469 U.S. 287, 292-93 (1985).

377. *See generally* Chester Residents Concerned for Quality Living v. Seif, 132 F.3d 925 (1997). Note, however, that the Supreme Court of the United States has ordered that this opinion be vacated. *See supra* note 375 and accompanying text.

378. 40 C.F.R. § 7.35(a) (1997).

379. 40 C.F.R. § 7.35(b) (1997).

case remain.[380] Depending on how these questions are resolved, state agencies may face private complaints alleging that the agencies' health-based environmental standards have a discriminatory effect on American Indians. And, in any event, complainants may challenge such state agency decisions via administrative avenues.[381] Finally, as noted above, Title VI itself has already been interpreted by the Supreme Court to reach intentional discrimination—and it could be that "intent" in this context will be given a broad reading. Taken together, these various means of redress under Title VI constrain agency standard-setting.

Title VI imposes several obligations relevant to state environmental agencies' efforts to set standards for the water and sediments on which fish and American Indians, especially in the Pacific Northwest, depend.[382] Under subpart (a) of EPA's implementing regulations, state environmental agencies setting health-based environmental standards may not provide a lesser benefit to Indians than is provided to others under the standards. Under subpart (b), a state agency may not "use criteria or methods of administering its program which have the effect of subjecting individuals to discrimination" because they are Indians, "or have the effect of defeating or substantially impairing accomplishment of the objectives of the program with respect to" American Indians.

Together, these provisions prohibit states from securing protec-

380. Notably, the Supreme Court has not expressly ruled on a plaintiff's burden of proof in Title VI suit. Federal courts have, however, routinely imported the Title VII evidentiary structure. *See, e.g.*, Larry P. v. Riles, 793 F.2d 969 (9th Cir. 1986). Accordingly, the plaintiff must first make a prima facie showing of disparate impact. The defendant can rebut the plaintiff's prima facie offering by demonstrating a legitimate, nondiscriminatory reason for the dispute practice. The plaintiff may nonetheless prevail by presenting a less discriminatory alternative that would serve the defendant's legitimate interests. This analytical framework presents numerous difficulties and uncertainties for environmental justice advocates challenging environmental standards; these obstacles arise at each juncture of proof. For example, a plaintiff must scale considerable evidentiary hurdles given the fact-intensive, statistical nature of disparity analysis. *See, e.g.*, Fisher, *supra* note 26, at 322-25. If the plaintiff succeeds in making out a prima facie case, the agency must then advance a legitimate, non-discriminatory reason, but in the case of agency defendants it is unclear what the analogue is to the "business necessity" rebuttal standard familiar from Title VII cases—what constitutes "agency necessity?" Another important question is how to define the "benefit" that is conferred by health and environmental programs or standards. Because one portion of the EPA's implementing regulation requires a recipient to confer equally the benefit of its program, whether there is a disparity may turn on how the benefit gets defined. Definition of the benefit conferred has proven elsewhere to be a malleable enterprise. *See, e.g., Choate*, 469 U.S. at 292-93.

381. 40 C.F.R. § 7.120 (1997).

382. *See, e.g.*, CRITFC Comments, *supra* note 1, at 6.

tion to a risk level of $1(10^{-6})$ for the general population but only to a risk level of $1(10^{-4})$ for Native American populations (as EPA's Draft AWCQ Revisions would permit). Such an approach would surely qualify as the provision of a lesser benefit to Indians than is provided to others. These provisions also require state agencies to hear and consider Native Americans' data regarding their fish consumption practices to ensure that the agencies' methods do not have the effect of discriminating against Native Americans by misunderstanding their practices—including the cultural importance of these practices—and thereby underestimating their consumption. Further, these provisions require state agencies to employ a fish consumption rate and other exposure factors that are reflective of Native Americans' actual consumption, so that agency judgment calls and methods do not have the effect of impairing the accomplishment of standards that are protective of fish-consuming humans.

3. *Synthesis.*

Agencies charged with regulating waters that affect treaty fishing rights must acknowledge that treaty fishing rights are affected by the standards they develop and by their choice of a fish consumption rate. As a starting point, at least for regulations affecting tribes' usual and accustomed fishing places, agencies must take care not to compromise tribal members' treaty-guaranteed right of taking fish. Current interpretations, however, which key health-based environmental standards to the practices of the general population, seem to guarantee a health-compromised fishery for the tribes. Setting environmental standards so as to ensure either the availability of either poisoned fish or no fish at all is tantamount to abrogating the promise to secure for the tribes the right of taking fish. Furthermore, agencies' customary balancing (e.g., trading less protection in favor of lower cleanup costs), is arguably inappropriate given treaty fishing rights' unique resistance to balancing against other priorities. Thus, agencies must respond to variability and to the fact that the identifiable subpopulation at the high end of the exposure distribution is comprised of members of treaty tribes. They can do this by using the maximum value for a variable quantity, or disaggregating the relevant subpopulations' data.

Federal agencies must also shoulder their trust responsibility, which would presumably affect their many roles, including setting standards (as in *Dioxin/Organichlorine Center*), approving states'

standards (as in *Natural Resource Defense Council*), or setting forth guidance or criteria documents. As noted above, the treaties and the trust obligation are this interstitial body of law that, properly understood, applies in concert with statutory and other legal obligations to inform federal agency discretion. Obligations flowing from treaties and trust constrain agency discretion and circumscribe permissible responses, such as choosing cut-off values or balancing cost and safety. Thus, however else agencies may strike the balance between cost and safety, they are not free to do so in a way that compromises their extraordinary obligations to American Indians and their treaty-secured fishing rights. The trust responsibility informs federal agency action affecting all tribes, treaty and non-treaty alike. It guides agencies charged with regulating waters fished by even non-treaty tribes, requiring agencies to protect the Native way of life from further incursions by the majority society.

Civil rights requirements must also be addressed. Title VI governs state agencies receiving EPA assistance and, under the terms of the EPA's implementing regulation, applies to any "American Indian." Thus, Title VI again must guide agency actions beyond those affecting treaty-covered "usual and accustomed areas." Under Title VI, in order to avoid providing to American Indians a "benefit that is different, or is provided differently from that provided to [non-Indians] under the program," and in order to avoid "us[ing] criteria or methods of administering its program which have the effect of subjecting [American Indians] to discrimination" or "have the effect of defeating or substantially impairing accomplishment of the objectives of the program," state agencies will have to reconsider their present approaches.

In addition, because every relevant EPA action should be informed by its trust responsibility, EPA oversight of states' compliance with the nondiscrimination requirements of Title VI, vis à vis American Indians, should itself be imbued with the particular heightened obligations of the trust. In all, the trust responsibility ought to be seen to inform any discretion that remains with the federal agencies as they determine how to fulfill treaty obligations or how to comply with civil rights requirements. It should operate in the interstices to ensure a robust interpretation of the treaties and civil rights requirements rather than a crabbed one. Moreover, members of the majority society in the United States should be understood to have undertaken costs and countenanced limitations on their own interests by dint of treaties and trust.

Executive commitments, including the Clinton Executive Order on Environmental Justice, and the Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments, should guide questions that remain about what exactly is required of agencies. Among the executive commitments contained in the Executive Order are those specifically addressed to the injustices experienced by Native Americans because of their fish consumption practices.[383]

Also included in the Executive Order are commitments addressed to the injustices arising from inadequate opportunities for Native Americans and other affected communities to participate meaningfully in the regulatory process. The Presidential Memorandum recognizes the "unique legal relationship" between the United States government and Native American tribal governments and directs executive departments and agencies that undertake activities "affecting Native American tribal rights or trust resources" to do so "in a knowledgeable, sensitive manner respectful of tribal sovereignty."[384] Specifically, the Memorandum directs the head of each department or agency to ensure that "the department or agency operates within a government-to-government relationship with federally recognized tribal governments."[385] These executive commitments, together with the legal obligations outlined above, may require agencies to not only seek distributive justice, but to also move beyond the distributive paradigm to accommodate the procedural and other components of environmental justice.[386]

What, then, would fulfillment of these various legal and other obligations require of agencies? Would it mean that an agency must choose a FCR number representative of the 90th percentile of tribes' fish consumption data where waters fished by tribes will be affected, because that agency has in the past typically targeted protection at the 90th percentile of the general population? Or would it mean that even a 90th percentile value from the tribes'

383. CRITFC's then executive director Ted Strong has made this connection:

> In light of the [CRITFC fish consumption] survey and EPA's recent conclusions on the toxicity of dioxin and related compounds, we believe that the health of tribal members is not adequately protected by existing federal and state policies . . . . We urge an investigation of the industrial permits issued . . . for possible violation of President Clinton's Executive Order on Environmental Justice . . . .

Hansen & Lurie, *supra* note 264.

384. Memorandum on April 29, 1994, Government-to-Government Relations With Native American Tribal Governments, 59 Fed. Reg. 22,951 (1994).

385. *Id.*

386. CRITFC Comments, *supra* note 1, at 6.

fish consumption data may exact too heavy a toll in light of the unique protections applicable to tribal reliance on fish and the extremely skewed distribution for fish consumption revealed by the tribes' data? And how should agency regulators integrate the different requirements applicable to federal and state agencies with respect to treaty and non-treaty tribal members?

In some particulars, given the data that undeniably now exist, room for agency exercise of discretion has been considerably diminished. However, room for debate remains in translating the requirements outlined above into agency modes of operation. Here, as elsewhere, it will be important to work with the tribes in a sensitive and respectful manner, on a government-to-government basis. My goal in this Part has been to emphasize the many obligations under which agencies should understand themselves to labor and to point out that the effect of the mix of these obligations—like the mix of some toxic chemicals—may be synergistic rather than merely additive.

VI. Recommendations for Consideration by Agencies and Tribes

Agencies should proceed with caution when using quantitative risk assessment, in full cognizance of its limited utility as a decisional tool, given the enormous gaps in the data on which QRA depends for its usefulness and its inability to live up to its touted neutrality. To the extent that health and environmental agencies continue to employ quantitative risk assessment, environmental justice concerns obligate them to change the way that they use it. In particular, when agencies set standards affecting Native peoples who exhibit variability and identifiability in fish consumption patterns, attention to the scientific, normative and doctrinal considerations outlined in the previous Part suggests the following practical measures. The recommendations are not meant to be exhaustive but are directed to the problems in toxicity regulation addressed by this paper. I offer these suggestions as possibilities to be considered by agencies and tribes as they approach these issues together.

A. *Respectful Interaction and Genuine Participation*

In order to do a decent job of setting health-based environmental standards that affect Native Americans and their resources, agencies must ensure respectful interaction with and meaningful participation by the affected tribes and their members. Respectful

interaction entails sensitivity to the tribes' cultures and recognition of rights to tribal self-government. For federal agencies, at least, it involves an awareness of operating within a government-to-government relationship. Meaningful participation means more than tribal oversight of or input into a pre-ordained regulatory approach. Rather, tribes and their members can contribute in important ways to framing the questions in the first place.[387] Health and environmental agencies can pursue several strategies to ensure such interaction and meaningful participation by Native peoples who are likely to bear the burden of unjust decisions.[388]

First, agencies need to involve risk-bearing tribes and their members *early* in the decision making process. Good administrative practice would advise involving early on those who might be affected by a decision.[389] When those affected include members of Indian tribes, the respect due to tribal governments commands early efforts at involvement.[390] Early inclusion of the tribes is also necessary so that all involved may help set the ground rules and determine the contours of the discussion. Members of the affected tribe may introduce questions of distributive justice and raise other issues that balance the cultural and normative assumptions of agencies' typical highly technical standard-setting process.[391] Early involvement is particularly important where the experience of affected individuals is unlikely to be shared by the dominant cul-

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387. *See* Williams, *supra* note 25, at 1157-64 (observing that "our environmental law, colonized by the same system of values which colonized Indian tribes, does not even bother to ask").

388. For additional recommendations to improve risk assessment's accessibility and procedural fairness, see Kuehn, *supra* note 26, at 160-66; Israel, *supra* note 90, at 516-19.

389. For criticism of the belated and limited involvement of the public and, particularly, of those who must bear the risks under the "decide-announce-defend" approach to environmental problem solving, see Kuehn, *supra* note 26, at 160-61 & nn.300-03.

390. In the case of federal agencies, for example, the Presidential Memorandum on Government-to-Government Relations With Native American Governments directs:

> Each executive department and agency shall consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. All such consultations are to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals . . . .
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> . . . Each executive department and agency shall assess the impact of Federal Government plans, projects, programs, and activities on tribal trust resources and assure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities.

Memorandum on April 29, 1994, Government-to-Government Relations with Native American Tribal Governments, 59 Fed. Reg. 22,951, 22,951 (1994).

391. *See generally, e.g.*, Gauna, *supra* note 102.

ture, and thus less likely to be considered by agencies in framing the questions before them. Even well-intentioned regulators may be unequipped to imagine exposure situations radically different from their own or from those described by data about the "average American."[392] Early involvement is also important given that those affected likely possess knowledge and information necessary to informed, scientifically defensible decisionmaking. Finally, regulators may make decisions early in the process that virtually foreclose later efforts at reconsideration.[393]

Second, agencies should be more receptive to information in "anecdotal," non-quantified, or other non-traditional forms. Qualitative information is often crucial to evaluating the problem. For instance, the anecdotal data presented to the EPA at the time it set the dioxin standard challenged in *Dioxin/Organochlorine Center* provided important data unavailable in quantified form. This qualitative data revealed inadequacies in EPA's 6.5 grams/day FCR clearly relevant to EPA's pursuit of a representative FCR. Qualitative information is also often crucial to interpretation of available quantitative data. This input will also counter-balance the fact that where the agency decision-making process is highly technical and information intensive, as in QRA, whoever provides the inputs (data) controls the outputs. Agencies are typically inundated with reams of information from risk producers,[394] most of it in the language of regulators, lawyers, and toxicologists,[395] much of it already quantified and packaged for ready use in agency risk analyses. Agencies typically receive far less information from those affected by risk; what little they receive may speak colloquially, anecdotally, or qualitatively. Agencies need to be willing to hear and consider information that comes to them in this form.[396]

Third, agencies should take affirmative steps to ensure that Native American voices get heard throughout the process. This may

392. CRITFC Comments, *supra* note 1, at 4.

393. *See, e.g.*, Coalition of Concerned Citizens Against I-670 v. Damian, 608 F. Supp. 110 (S.D. Ohio 1984).

394. For the point that both access to agency decisionmaking and the process itself are biased in favor of risk producers, who are typically sophisticated, well-organized, and well-financed, see Gillette & Krier, *supra* note 99, at 1064-88.

395. *See id.* at 1098 (noting that experts are likely to share a common language and world view due to their education and training).

396. For arguments that public access to risk debates ought to be expanded in order to take advantage of the "rich complexity of nontechnical risk evaluation," see Ellen K. Silbergeld, *The Risks of Comparing Risks*, 3 N.Y.U. ENVTL. L.J. 405, 419-21 (1995).

require a range of "non-neutral"[397] agency efforts: agencies should actively solicit both formal and informal input from the affected tribe; agencies must acknowledge and accept tribes' expertise and knowledge (e.g., resource management departments and tribal members); agencies should take steps to become sufficiently conversant with tribes' history, culture and concerns so as to permit themselves to interact with tribal members in sensitive and respectful ways;[398] agencies should provide financial resources for tribes to develop the institutional capacity to meet their own environmental management objectives;[399] agencies might hold or jointly sponsor workshops with tribes that facilitate the mutual exchange of information; and agencies may need to develop protocols to ensure protection of sensitive tribal information from general disclosure.[400] On some fronts, relatively small efforts would yield high returns. For example, agencies should hold public meetings at a time and place that permits risk-bearing tribes and their members—not only the risk-producing stakeholders—to attend and participate.[401] This would require that meetings be scheduled to avoid conflicts with tribal ceremonies or other significant events; it might require that some meetings be held, upon invitation, in community centers

397. *See* CASS R. SUNSTEIN, FREE MARKETS AND SOCIAL JUSTICE 3-5 (1997); Foster, *supra* note 26, at 802.

398. *See* Williams, *supra* note 25, at 1157-64 (noting differences in this regard between Zuni and San Carlos Apache "tribes," describing complexities of politics and conflicting religious belief systems among Apache bands comprising the San Carlos Apache reservation, and noting that tribal governments are not necessarily representative of tribes on traditional or religious matters).

399. *See, e.g.*, Suagee, *supra* note 26, at 492 (pointing out that "[w]hatever else environmental justice means, in Indian country the concept must include recognition that tribes need a lot more federal assistance to build effective environmental regulatory programs").

400. *See* SECRETARY OF INTERIOR AND SECRETARY OF COMMERCE, JOINT SECRETARIAL ORDER ON AMERICAN INDIAN TRIBAL RIGHTS, FEDERAL-TRIBAL TRUST RESPONSIBILITIES, AND THE ENDANGERED SPECIES ACT at Principle 5 (1997) (providing that the Departments shall strive to protect sensitive tribal information that has been disclosed to or collected by the Departments); WHITE MOUNTAIN APACHE TRIBE AND U.S. FISH & WILDLIFE SERVICE, REGION 2, STATEMENT OF THE RELATIONSHIP BETWEEN THE WHITE MOUNTAIN APACHE TRIBE AND THE US FISH AND WILDLIFE SERVICE: PROTOCOL FOR INFORMATION MANAGEMENT (1994) ("As set forth in the Statement of Relationship, and pursuant to the trust obligations of the United States to the Tribe, both the Tribe and the Service desire to establish protocols to facilitate sharing of information while ensuring that Tribal proprietary, commercial, and other confidential information is protected . . . .").

401. As Los Angeles community member Robin Cannon reported, in order to attend the public meetings on the proposed L.A. City Energy Recovery Project, "I was using my vacation time to go to hearings during the work day." Cynthia Hamilton, *Women, Home and Community: The Struggle in an Urban Environment*, RACE, POVERTY & ENV'T, Apr. 1990, at 3, 12.

or in other gathering places on or near affected tribes' reservations.

In any event, agencies should *ask* members of the affected tribes what methods would best work for them—the optimal approach will likely differ from tribe to tribe. Agencies and legislatures also need to provide funding to enable affected tribes and their members to participate fully in the complex decisions that result in unequal distribution of risk. Tribes and their members often will not have financial resources commensurate with the resources that risk producers typically devote to influencing the administrative decision making process. Some statutes and regulations already devote funds for public interest group, citizen, or tribal participation.[402] Existing grant opportunities, however, provide only modest sums and may be limited to specific contexts, such as CERCLA cleanups.

Finally, agencies should facilitate the informed deliberation that needs to attend regulatory choices involving exposure variability and identifiability by indicating clearly and openly that these considerations are at stake. When, for example, the EPA proposed in the regulations at issue in *Dioxin/Organochlorine Center v. Clarke* to employ an FCR that at best described the 50th percentile of the general population, the EPA should have alerted the affected tribes and public that this was an explicit choice of lower protection for actual, known individuals in American Indian and other higher-consuming subpopulations. A related but more general point is that agencies should not gloss over the many subjective judgments they make in risk assessment and risk management. Moreover, where the identifiable subpopulation is Native American, agencies should acknowledge that their choices are constrained in accordance with the normative and doctrinal considerations outlined in the previous Part.

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402. The EPA's Technical Assistance Grant program, for example, provides grants of up to $50,000 to community organizations for technical assistance in interpreting information at federal Superfund sites. 42 U.S.C. § 9617(e) (1988); 40 C.F.R. §§ 35.4000-.4130 (1995). Some argue that these grants need to be available earlier in the cleanup process. *See* Deeohn Ferris, *Communities of Color and Hazardous Waste Cleanup: Expanding Public Participation in the Federal Superfund Program*, 21 FORDHAM URB. L.J. 671, 680 (1994); Kuehn, *supra* note 26, at 163. Others suggest that the complicated application process for TAG grants creates barriers to access. *See generally* RICHARD L. HEMBRA, U.S. GENERAL ACCOUNTING OFFICE, EPA'S SUPERFUND TAG PROGRAM: GRANTS BENEFIT CITIZENS BUT ADMINISTRATIVE BARRIERS REMAIN (1992).

B. *Appropriate Subpopulation Data*

First, agencies need to employ the fish consumption data that has been gathered. For example, it is absolutely unacceptable for the EPA and Oregon and Idaho to continue largely to ignore the CRITFC and Toy et al. studies.[403] EPA and other agencies have claimed an inability to adjust their standard assumptions without quantified data about Native American fish consumption. Now that quantified data is available, there is no longer any reason for delay.

Second, agencies need to facilitate continued data-gathering. In the case of fish consumption, health and environmental agencies are aware that there is considerable variability among subpopulations; and they know or suspect, based on anecdotal evidence, the identity of the subpopulations that occupy the high end of the distribution. Given recent decisions in the Ninth and Fourth Circuits rejecting agency mandates to regulate to protect a subpopulation without supporting quantitative data, the existence of such data becomes important for agencies interested in ensuring both scientifically defensible and just regulatory decisions.

To be valid, quantitative subpopulation data will not result from a one-size-fits-all approach. Because fish consumption rates, as well as species and parts consumed, may vary considerably with local ecological and cultural circumstances, agencies may need to see that relevant subpopulation studies account for the different consumption patterns of various tribes affected by decisions under their jurisdiction. Specifically, agencies will need to fund and otherwise assist data gathering by the subpopulations they have reason to believe consume higher quantities of fish, as affected subpopulations will often have insufficient financial resources to support with quantitative studies what they know to be true.[404]

While acting to ensure that appropriate subpopulation data is assembled, agencies should attend to protection of Native American subpopulations' health in the meantime. Recent studies, together with anecdotal evidence, should give agencies a sense of the wide variability in the fish consumption rate, and direct them to subpopulations that occupy the upper regions of the distribution for fish consumption rates. As a bridge strategy, an agency regulat-

403. Of the states in the Pacific Northwest, only Washington has made any real effort to consider these studies. *See* KEILL & KISSINGER, *supra* note 174.

404. *See, e.g.*, CRITFC Comments, *supra* note 1, at 9.

ing waters affecting American Indian fish consumers (e.g., in a state such as Virginia or Maryland) now can at least look to the CRITFC and Toy et al. studies for fish consumption values that are more likely to be representative of tribal consumption than the national per capita default values. Although, given differences among tribes, this approach is somewhat precarious, it is an improvement over recourse to a default keyed to the general population.[405]

VII. CONCLUSION

Agencies have before them an opportunity and an obligation to set environmental standards for regulating toxicity in fish that better reflect an understanding of what is at stake for Native Americans. Agencies possess quantified fish consumption data showing subpopulations to consume significantly greater quantities of fish than the general population. Because these data clearly identify Native Americans as among the most highly exposed, agencies know who it is that will be left underprotected by a choice of an average or mean fish consumption rate. Agencies know who will be subjected to risks orders of magnitude greater than risks deemed "acceptable." The debate is not about identitiless, statistical lives.

Agencies also have at hand testaments to the importance of fish, fishing, and fish consumption to the Pacific Northwest peoples. Agencies need only look to tribes' reservation of their fishing rights in treaties a century and a half ago, or listen to tribes' educative efforts in contemporary times to appreciate that what is at stake for these Native American subpopulations is different than what is at stake for the general population or for recreational anglers. If agencies are to respect cultural integrity, they must make decisions in light of the understanding that "fish, especially salmon, . . . [are] not only a major food source for tribal members, [but] an integral part of the tribes' cultural, economic, and spiritual well-being."[406]

Finally, agencies should embrace their obligations under treaties between the United States and the First Nations, under the federal trust responsibility, and under Title VI of the Civil Rights

405. EPA's Draft AWQC Revisions support this approach as the second in the hierarchy of preferences, with the first preference being the use of local data. *See supra* notes 201-07 and accompanying text.

406. CRITFC Comments, *supra* note 1, at 2.

Act of 1964. Whether they choose QRA or some other decisional tool, agencies must ultimately ensure that their decisions comport with the government's overarching obligations to affected Native Americans. The rights and resources secured by these obligations are not susceptible to standard-fare balancing; agencies are not free to trade encroachment on tribes' treaty-secured rights for some savings in economic costs or political capital.

To the credit of all involved, agencies have begun to register a concern for environmental justice. Agencies' understanding of what environmental justice requires with respect to the multiple forces that together threaten Native Americans' ways of life at this point appears to be rudimentary; the contours of environmental justice here are indeed complex. Recent executive commitments to address the concerns of subsistence fishers and to interact with tribes on a government-to-government basis are steps in the right direction. But, as this Article's exploration of environmental standard-setting demonstrates, there is much work yet to be done.