WHITE PAPER ON BEHALF OF THE KARUK TRIBE OF CALIFORNIA

A Context Statement Concerning the Effect of Iron Gate Dam on Traditional Resource Uses and Cultural Patterns of the Karuk People Within the Klamath River Corridor

Written Under Contract with PacifiCorp in Connection with Federal Energy Relicensing Commission Proceedings Concerning the Relicensing of Iron Gate Dam

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Executive Summary

This paper documents Karuk tribal uses of resources found within the Klamath River corridor which may be affected by the Klamath Hydroelectric Project. This great range of resources includes plants, animals, and fish as well as locations long enshrined in mythic accounts of legendary events. From millennia of dependence on these resources and location in the specific environment of the Klamath River corridor, a dense web of cultural practices and social institutions has developed that define the Karuk People. In order to establish the depth and unity of these cultural utilizations with the environment and their consequent vulnerability to influences inimical to the environment, the following strategy has been developed. Section I presents a reconstruction of the natural setting and patterns of early habitation of Karuk Ancestral Territory. Particular attention is paid to those cultural elements which are directly dependent on the Klamath River health and upon fish-based resources.

Section II follows this establishment of setting and duration of cultural adaptations with a series of ethnographic interviews of Karuk people and knowledgeable individuals. Interviewees were presented with an extensive series of questions and issues concerning cultural and natural resources of the Karuk, and other Klamath River corridor tribes, which may be subject to effects caused by Iron Gate Dam. This same inventory has been incorporated in a series of white papers being written on behalf of these other tribes in conjunction with the upcoming Federal Energy Relicensing Commission (FERC) proceedings concerning relicensing of Iron Gate Dam. The utilization of similar inventories of questions and issues is intended to produce a body of information approaching the Klamath River as an extended ethnographic landscape reaching from the region of Klamath Lake and the territory of the Klamath Tribe to the River's mouth at the Pacific Ocean where the Yurok live. Interview transcripts have been coded according to the issues addressed by the informants. This section of ethnographic interviews and empirically-based observations is followed by Section III, Current Conditions and Historical Factors Affecting Fish Populations and River Health, a discussion of water quality and fish passage issues drawn from ethnographic and recent scientific literature.

This paper ends with a Summary and Conclusion which summarizes the material developed in the text as described, bringing together, within an ethnographic context, the conclusions of formal articles with those of the Karuk informants concerning the effect of Iron Gate Dam on the cultural and natural resources of the Karuk Tribe and People.

Introduction

PacifiCorp (Company) is entering into a professional services contract with the Consultant on behalf of the Karuk Tribe of California for the identification and documentation of traditional cultural properties, other sensitive cultural resources, those properties and resources' ethnographic contexts associated with Karuk tribal uses within the Klamath River Corridor that may be affected by the Klamath Hydroelectric Project. The purpose of this study is to develop a context statement on the ethnohistoric, ethnographic, and historical evidence of traditional patterns of use and belief in the Klamath River Corridor. A context statement will assist PacifiCorp and the Federal Energy Relicensing Commission (FERC) in making a National Register determination of eligibility for the Klamath River as an ethnographic riverscape. This information will be used to satisfy both requirements: of Section 106 of the National Historic Preservation Act (NHPA) and National Environmental Policy Act (NEPA) and to develop Protection, Mitigation and Enhancements Measures in the Historic Properties Management Plan or Programmatic Agreement(s).

The results of this study will be integrated with other tribal ethnographic Klamath riverscape studies generated by this project. The purpose of the individual Tribal reports is to provide information to a "final anthropologist" who will be funded through five tribal contracts. The purpose of the final report is to bring together the several studies into a single document evaluating the effect of Iron Gate Dam on the river as an ethnographic riverscape in its totality. This final integrated tribal ethnographic study will identify impacts from hydroelectric project operations to culturally significant traditional Native American culture and resources such as water, fish, wildlife, plants, as those resources are defined within the ethnographic riverscape context.

The Karuk Tribe of California, a Federally Recognized Indian Tribe, occupies some 1,400,000 acres of land located in Siskiyou and Humboldt Counties of northern California. According to oral tradition as well as archaeological evidence, ancestors of the current Karuk people were among the earliest inhabitants of aboriginal California (Whistler 1979).

I. Natural Setting and Reconstruction of Early Patterns of Habitation of the Klamath Basin

The lands of the Karuk are characterized by the steeply folded and faulted mountains typical of the Klamath Basin. Mountains range in height from 600 – 7,500 feet in elevation and give rise to a dendritic pattern of streams that empty into the Klamath and Salmon Rivers. While relatively little archaeological work has taken place within Karuk Ancestral Territory, sites in nearby Lake County are dated in excess of 10,000 B.P. (Kaufman 1980; Meighan and Haynes 1970). Based upon linguistic evidence, K.W. Whistler (1979) has hypothesized that the Northwest Coast region of California was first occupied by the Paleo-Indian ancestors of the Karuk. Whistler's reconstruction of a sequential inhabitation of aboriginal northern California's places the ancestral Karuk as the first to arrive in the area, followed by the Wiyot around 1,100 B.P. Some 200 years later the Yurok, moved down through the Columbia River Plateau to settle in the coastal strip they continue to occupy.

With the absence of direct archaeological evidence, linguists are often called upon to provide a theoretical explanation for ancient patterns of human development. In this regard linguists have been an important source of hypotheses concerning the peopling of northwestern California as the rising waters of the Pacific Ocean have placed many of the early coastal sites as much as twenty miles to sea at present times. The linguistic work of Bauman and Silver (1975) suggests that the Karuk and Wiyot had been direct neighbors prior to arrival of the Yurok and their settlement on the coast and lower stretches of the Klamath River in a pattern displacing the Wiyot. The Karuk, long in place from the Klamath Basin to the coast, reacted to the arrival of these new populations in two manners. They largely abandoned the coastal strip as a base of occupation and began trading with the new populations while adopting the newly available technologies for fishing, preserving and storing fish brought into the region by arriving people whose lives had long depended on the use of salmon and acorns (Schalk 1977 and McDonald 1979). The marked differentiation of Karuk language from affiliate languages of the Hokan linguistic stock is another indication of the time that the Karuk have lived as a people with a common language and cultural identity long removed from its place of origin. "The language is not closely or obviously related to any other; its presumed Hokan affiliations are distant. There was no known dialect differentiation" (Shipley in Sturtevant ed. 1978 p. 84).

Characteristic of any peoples arriving in a new land, the ancestral Karuk depended upon hunting and gathering strategies familiar to them until the arrival of the relative newcomers who brought with them a riverene and coastal-based pattern of subsistence. Until this time the ancestral Karuk had followed the ancient and broadly similar cultural pattern of Paleo-Indians. The Paleo-Indian Period represents "a way of life successful enough to be pursued with little change for thousands of years" (Chartkoff and Chartkoff 1984 p. 38). Paleo-Indian culture was characterized by a small highly diffuse population depending on hunting the mega fauna big game present in the California of that time. This included bison, mammoth,

camelid, horse and other big game as well as utilizing certain plants and small animals, perhaps known to them from their earlier territory.

Following the migratory wanderings of big game is a highly nomadic lifestyle allowing the possession of few tools to encumber the perpetual movement through a large territory (Ibid.). This pattern of a newly arrived population not yet possessing the tools or knowledge to make use of new resources is quite common. The English settlers at Jamestown in 1620 are an apt example of the difficulties faced by pioneers arriving in a new environment. Even with a stock of relatively sophisticated metal tools and lacking the demanding necessity of a migratory lifestyle, 90 percent of the newcomers died of starvation or starvation related diseases within three years. This notable rate of die off was a result of their lack of knowledge relating to an efficient exploitation of the rich resources surrounding them and long supporting large stable native populations. Similarly, the Paleo-Indian pioneers to California did not possess the complex knowledge and technologies required to sustain themselves and flourish on the existing salmon and acorns.

Mrs. Bessie Tripp, a Karuk Indian of the village of Vunharuk (Long, smooth flow of water) on the lower Salmon River, illustrated this dynamic of new arrivals and selective cultural adaptation in her recollections of her grandfather helping the first white men, mining engineers, to arrive in the area probably around 1849 or 1850. The newcomers had eaten their seven mules and were rapidly starving to death when her grandfather had young men build them a Karuk style dwelling from his stock of sugar pine planks and supplied them with salmon, acorns and the knowledge necessary to preparing these staples. With the aid and technological know-how of the natives, the engineers survived the winter and departed in the spring. In turn her grandfather soon learned through the invasion which followed, of the variety of food plants raised by the European newcomers. He traveled up and down the rivers planting apple trees and distributing vegetable seeds and the basic knowledge to grow them.

The Paleo-Indian ancestors of the Ethnographic Karuk exploited only those resources with they were familiar, a cultural pattern characterized as “focal” by Charles Cleland 1976). The great advantage of this economic adaptation, and one reason it stood the test of thousands of years successfully, was that by focusing on a relative few resources these original pioneers retained the mobility required to follow large game animals as a major economic strategy. The accompanying disadvantages of small, widely dispersed bands limited the overall potential for population growth and cultural change. Climactic change in this period was one of great fluctuations in temperature and rainfall. The extent of glaciation in the more extreme of these periods played a significant role in limiting the resources and land area available for Paleo-Indian exploitation (Alt & Hyndman 1975:87-89). Additionally a constantly changing climate restricted environmental diversity and further limited the range of economic adaptations available by necessitating a focus on those resources that remained relatively stable and available.

The Archaic Period

The Paleo-Indian cultural tradition gradually passed into what is known as the Archaic Period some 6,000 years ago as a result of a new order of changes in the climate and environment.

With a climate that gradually became both dryer and warmer, and with thousands of years of occupation of the new territory behind them, the Paleo-Indian pioneers of northern California developed new stone tool-based technologies and in the same period the mega-fauna upon which the earlier economy had depended went through mass extinctions as a result of climate change unfavorable to their continued existence. In this period the endless following of migratory herds of megafauna was replaced by a pattern of seasonal migrations based upon an enlarged range of plant and animal resources. In this same period some tools were retained while others were developed and refined. New forms of tool manufacture such as basketry and the development of ground-stone tools including highly dressed and polished bowl mortars became feasible and practical with assumption of the more predictable form of migration based upon seasonal availability of resources.

It was in the Archaic Period that the ancestral Karuk first began to locate themselves more directly in relation to the Klamath River and its rich resources. While this early association was not of the intensity to develop in the later Pacific Period, it did mark a great transition into the first adaptations of life to the riverene environment that characterize the ethnographic Karuk. Population densities remained relatively low but a broader range of resources were being more skillfully employed to gain greater control over the environment. Just as the migratory life of the Paleo-Indians was gradually superceded by the more broadly developed culture of the Archaic Period, the advances in cultural development of the Archaic Period were followed in turn by still greater cultural and social changes. It was in this period that the ancestral ethnographic Karuk developed the elaborate and sustainable life style based upon a large number of villages linked by ceremonies to one another, and to the down river tribes first encountered by Europeans in the early 1850s.

Evidence from a variety of scholarly fields including archaeological, linguistic and oral history, indicate that the ancestral Karuk had occupied the lands of the Klamath Basin and Coastal Zone for thousands of years before the arrival of ancestral Wiyot and Yurok approximately 1000 B.P. The migration of these relative newcomers down the Pacific Coast from regions heavily dependent on the ability to fully utilize salmon brought to northern California for the first time the knowledge of riverene specializations including that of storing and fully utilizing the various species of acorn abundant in the region. These two critical bodies of subsistence-related knowledge allowed the ancestral Karuk of the Pacific Period to fully adopt the settled riverene, village-based lifestyle of the ethnographic Karuk. At the same time the Karuk retreated from the coastal regions which they had previously occupied uncontested to take up the riverene life for which they became known (Moratto 1984: 483).

Although the Karuk were characterized by in a simplistic phrase by early ethnographers as a "salmon and acorn" people, in fact they also continued to utilize the upland resources of the area for seasonal procurement of acorns, game, basketry materials, and other resources and for religious purposes rather than for habitation (Kroeber 1925). Archaeological excavations of the interior area of northwestern California support this analysis of the Pacific Period ancestral Karuk living in permanent settled villages adjacent to the river while continuing to exploit high country resources. These studies indicate that although major village settlements

were located along the river systems, there were as well sites present on high ridges (H. Wylie 1976). Additionally, some 160 late prehistoric sites on the upper Klamath River within Karuk Ancestral Territory indicate that both site placement and population density were dependent on ease of fish procurement (Chartkoff & Chartkoff 1975).

The caches of smoked and sun-dried salmon of the Pacific Period would allow more than 100ancestral Karuk villages to develop along the Klamath and Salmon Rivers with a dependable source of food to carry a relatively dense population through the long hard winters of the Klamath Basin. It was during these winters that stories were told while nets were woven and repaired and tools and the celebrated ceremonial regalia of the area fabricated.

An indication of the close focus of Karuk life may be gauged from the aboriginal law that stories could only be told after the Acku-n, or swamp robin (Varied Thrush) returned from it's northern migration to winter in the Klamath Basin. In the accompanying legend the Tu-s, or yellow-breasted chat arrives in the spring and is welcomed as a true harbinger. Everyone is glad to hear the Tu-s as a true harbinger of spring (pimnonahesh (pim=before; nonahesh=summer). The thrush Tu-s has the praise go to its head and begins singing late into the night so that by late summer people are commenting that that bird never stops singing. The Tu-s goes into a huff and leaves which opens the way for the Acku-n to return (personal communication; Dwayne Allen 1997). This story also illustrates the way Karuk stories were constructed in such a way as to be of interest and catch in the mind of young listeners to be reinterpreted with deeper social and psychological meaning, as the listener becomes with age, the teller.

Villages

From antiquity reaching back immemorially to the Pacific Period, on one scale, and on another, to the time of the Ikhareya, the Immortals who prepared the way for the coming humans, the Karuk lived in fixed villages along the Klamath and a portion of the Salmon River. As with the downriver Hupa and Yurok who lived respectively along the banks of the Trinity and the joint Klamath Rivers, Karuk society was a long winding sequence of villages placed upon favorable beaches, bends, benches and fishing sites, centering life on the bounty, transportation and ceremony of the rivers. The Karuk lived in family houses and sweat lodges of hand split and adzed sugar pine planks.

The lands above the river was utilized for hunting and gathering of foodstuffs and firewood. These seasonal hunting and gathering areas were visited and camped in for varying periods each year but the real villages were all found along the rivers which provided the thread joining villages and Indian people from the upper Klamath Basin to the Coast. The natural richness of this environment found expression in a wealth of ceremony, regalia and material goods without equal in California. As the southernmost expression of the great northwestern culture area stretching from the Klamath River to Alaska, for the Karuk and the other Klamath and Trinity River tribes, the Yurok and Hupa, the rivers were the highways connecting these people, among themselves and between tribes alike in every regard except language.

Although closely involved by marriage, ceremony and culture with other tribes of the area, the Karuk remained largely isolated from white contact prior to the arrival of miners, packers and tradesmen in 1850 and 1851 with the discovery of gold in the region. While villages were placed in advantageous locations on bluffs and bends of the Klamath River for the distance of Karuk territory, there were three zones of clustered villages that stood out and were each located at the mouth of sizeable watercourses entering the Klamath. These groups of villages were located, in order from downriver to upriver, at the mouths of Camp Creek (Tishaniik), the Salmon River (Mashuashav), and Clear Creek (Inam).

In 1852 whites burned the sacred villages of Yutamin and Katamin (Lower Dam and Upper Dam), site of the annual World Renewal Ceremonies near the mouth of the Salmon River. Ike's Falls, an area of intense rapids and holding places for migrating fish, is a famous fishing station approximately one mile downstream of the mouth of the Salmon River. At this place, on the east side of the river was the village of Ashanamkarak. Across the river was Amekiarum, a dance village and site of the First Salmon Ceremony. Just downriver from the mouth of the Salmon River was a small flat, Ashapipmam, the site of the Jump Dance. Just above the Salmon Rivers intersection with the much larger Klamath River and on the east side of the Klamath stands A'uich, or Sugarloaf, a pyramidal peak severed from a ridge by river action in past geologic ages, which stands as the center of the Karuk world together with the associated flat Katamin (isivsanem ach), the principal site of the Pikiavish or World Renewal Ceremonies, including the White Deer Skin Dance for which the Karuk are renowned. Across the river from Katamin, at this most sacred of village clusters and ceremonial areas, is Ishipishi (The End), so named as it marks the point at the river that is the end of the Medicine Man's (Fatawaanun) trail.

Up river from Katamin some 20 miles and at the mouth of Clear Creek was Inam, site of the first enactment of the annual Deerskin Dances. Some eight miles down the Klamath from the mouth of the Salmon lay Paniminik, another ceremonial village that became the location of the town of Orleans. In the two decades following first contact with Europeans, the easily accessible placer gold was mined away and as mining became an enterprise requiring capitol and massive mining equipment, miners declined in numbers and Karuk people returned to their ancestral territory, sometimes resettling in their old village sites despite these villages having burned and ransacked repeatedly. The favorable locations of Karuk villages at these places made them equally desirable for the Whites who had come to the area and what had been Karuk village sites became the towns of Orleans, Somes Bar and Happy Camp.

Karuk villages were also located along the Salmon River, the largest of the Klamath tributaries. The Karuk maintained villages for roughly half the distance from the mouth of the Salmon near Katamin to Forks of Salmon, some 15 miles up river that was home to the Shastan Konomihu.

Culture

It is from the rivers in their aboriginal wildness, that the core cultures of northwestern California, those of the Yurok, Hupa and Karuk, developed their elaborate and specialized

expressions. The relative plenitude of resources in this area was husbanded by long developed strategies of land management, largely through the use of cool-burning controlled fires in combination with a rich and elaborate ceremonial expression of respect and responsibility to the natural environment and its spiritual expressions.

Material Culture

The material culture of the core cultures, including the Karuk, was observed by Kroeber, as being undistinguished from other California Native cultures in their range of inventions, but excelling in craftsmanship and decorative qualities. Kroeber refers to this as difference as "deep seated and …manifest at almost every point" (Kroeber 1925, p. 1-2). He goes on to list a range of material objects including slab houses, canoes, mauls, pipes, acorn stirrers, netting shuttles, spoons and obsidian blades which the core cultures shared with other California Native cultures, but which in the core area demonstrated "a different attitude, an appreciation of values which in the ruder central and southern tracts is disregarded" (Ibid.). Outside the core area, objects were likely to be made of the relatively undemanding material of wood and would remain unadorned with decorative elaborations such as carved or incised motifs. Within the core area, the same object was likely to be fabricated of a more demanding raw material such as antler or stone and to be decorated with a level of interest not generally present in the remainder of California.

The same process of elaborated decoration and heightened interest which holds for cultural objects was also true for money. Money was known and prized throughout aboriginal California, but it was in the core culture area of Northwestern California that the influence of money and the elaboration of prices, fees and fines reached a peak. While tribes from every portion of California were aware of and made use of the institutions of blood money, bride price, and monetary compensation to mourners prior to holding a ceremony, it was only in the core area that "every injury, each privilege or wrong or trespass is calculated and compensated" and "His law is of the utmost refinement. A few simple and basic principles are projected into the most intricate subtleties; and there is no contingency which they do not cover" (Ibid. pp. 2-3).

At the same time the Karuk and other core area cultures so clearly represent a larger northwest cultural influence, they lack even the rudiments of the elaborate social organization or political units characteristic of northwestern tribes such as the Kwakiutl or Haida, being entirely individualistic with regard to society. There are no "clans exogamic groups, chiefs or governors" (Ibid. p.3).

Values

Although Kroeber visited the Karuk periodically beginning in 1900, the same remoteness that left the Karuk relatively less impacted by the invasion of Europeans than their downriver neighbors the Hupa and Yurok, left them relatively unstudied by the ethnographers of the late nineteenth and early twentieth centuries. Unlike their larger downriver neighbor the Yurok, whose territory included the highly desirable coastal zone and unlike the Hupa, the Karuk never had a reservation established. Although there were military efforts to force the Karuk

onto the Hupa reservation, the attempts were abandoned following what was known as "The Red Cap Wars" and following the extensive destruction of their villages in the early years of the gold rush, the Karuk returned to the sites of their former communities.

Writing in 1877, Powers referred to the Karuk as probably the finest tribe in California." Speaking to Karuk character and personality, he observed the Karuk to be "brave when need is extremely curious, inquisitively and quick to imitate… and merry with his peers." (1877:21) Beginning some four decades later, A.L. Kroeber wrote extensively on the relatively accessible Yurok with which he tended to merge the Karuk culture, considering the two as "indistinguishable in appearance and customs, except for certain minutiae" (Kroeber 1925:98)

Kennedy (1949) offers the following summation of Karuk values that incorporate a reflection of their worldview:

> (1) Great emphasis was placed on the acquisition and possession of property, in the form of dentalium shells or other wealth objects such as Woodpecker scalps and obsidian blades. Such "money" was only occasionally used purchase necessities such as food, which was abundant; rather the importance of wealth was as a mark of social position.
>
> (2) The highest respect and prestige was accorded to the wealthy person; Karoks speaking English sometimes use the term "good people."
>
> (3) Abstemiousness and thrift were valued. As one of Kennedy's informants said: "Good people didn't have many children. Some people never married, so they had lots of acorns. Lizzie's mother told her it was a good thing not to marry, because then you can think about money, how to get things."
>
> (4) Another road to wealth was to be industrious; the first lesson taught children was not to be lazy.
>
> (5) As another means to become wealthy, magic was highly regarded; thus men performed songs and prayers for success hunting or in gambling. Some people, called "Indian devils," supposedly employed witchcraft to enrich themselves; such sorcerers were feared but not necessarily condemned.
>
> (6) For all their wealth, rich people were not supposed to show off or be stingy. Lest poor people make bad luck for them. "You should treat poor people just the same as good people."
>
> (9) For success in life, it was important to observe many magical practices and taboos. Many of these related to sex, which was regarded as the enemy of wealth. Puritanical attitudes toward sex were the result.

Environmental Relations

Over an uninterrupted period thousands of years the Karuk people developed land management to a fine science. The conjunction of ritual, spiritual and technical elements for the management of sustained vigorous ecosystems resulted in a system of land management and cultural perspectives among the Karuk and the neighboring tribes which not only were not destructive of the natural systems within which they lived, but which in fact served consciously to enhance and enrich the diversity of these systems. These strategies of management were maintained from the grass roots level, not by a powerful command structure imposing its will on the land.

The indigenous knowledge behind Indian land management was derived from close observation and dependent involvement with the processes of nature, e.g., fires started by lightning toward the top of a ridge burned down slope cooler than fires which were burning up a ridge. These observations were then applied to the intentional and purposive management of the land and were fine-tuned over a period of time to include additional considerations such as time of year, humidity, wind and temperature.

According to Bessie Tripp, a Karuk woman born in 1876, the Karuk use of fire, as well as the cessation of Karuk burning practices, had profound social and ecological consequences.

> Sets fire, that's the way they do. There all time fire and everything grow then, like they used to eat here. All those things that they used to eat, y'know, you get in the ground. Now I don't think there is any, too much brush growing. That's only the way they used to grow plants (Salter 1981).

The Karuk use of fire as a land management tool was complex and multi-faceted. As with other ceremonial and religious aspects of Karuk culture, the role of fire was one to be contemplated and learned from at the deepest levels. Born in 1904, Johnny Bennett was a Karuk Indian and a lifelong resident of the Salmon River country. In the following statement recorded in 1977, Mr. Bennett discusses his sense of an appropriate relationship of humans to the process of natural succession. He considers the evolution of the forest as a complex process, not entirely comprehensible, but nevertheless subject to penetrating study, one aim being to bring cultural processes into agreement with those of nature. This non-dominating but purposeful relationship to nature is enriched and raised to the level of philosophy by the contemplative quality of his observations. These considerations of the relationship between lightning, biological evolution and cultural practices reflect a uniquely Karuk perspective which is simultaneously sacred and utilitarian.

> I'd like to know what the fires for. I'd just like to know what was the fire for in a lightning, why did it have to burn? It's for some cause now. It could storm without that, y'know, but it had to burn. I think about it many times. The old Indians say the Creator made it that way to clean out the forest. In places where it hit there would be a burn out, y'know, and they never put it out. They'd push it back up the mountain and it would burn, let it go. They wouldn't bother it because they claim it was put there for some cause, and they

> said it was good because they could sneak up on their game, pick up their acorns, and it generally never damaged much, because you could go to a forest, great big old trees, like redwoods, been burnt once, the bark is black. One time there was fire there and the same way in this country, when the lightning hit they never put it out, push them back, make a fire line, let them go back up the mountain. Take sticks out there, burn up against it (Ibid.).

Johnny's discussion moves fluidly from metaphysics to warm personal memories, from the utilization of fire in his own boyhood back to the level of generalization with recognition of the elemental qualities of nature as an implacable total system. His defense of natural processes and relationships is coupled with a mistrust of events and perspectives that tend to alter or slice through this complex system of relationships. From long observation of the self-corrective process of the forest, a series of verities has been deduced which may be formulated as follows: all relationships, in human society as well as in the natural ecology, exist within a range of limits analogous to the cyclical limits observable within nature, and are subject to the same processes of nurturement or destruction as are ecological systems; understanding and harmony with these enduring principles exist at levels which include the conscious and verbal as well as the unconscious and non-verbal. Human life and society are affirmed as aspects of a more inclusive system of natural processes by these conceptions of the forest and of the place of the community in relation to the forest (Ibid.).

Oral Literature

The oral literature of the Karuk resides in a complex set of stories which again illustrate the reality of a river-based ethnographic landscape. Snyder (1931) observes:

> The lore of these people is replete with legends relating to the things about them. They were greatly restricted in their geographic outlook, but they seem to have been closely acquainted with every detail of their own land. They were essentially nature worshipers, and the fishes, reptiles, birds and mammals were adopted into intimate spiritual companionship (p.8).

The stories of the Karuk are virtually indistinguishable from those of the Yurok aside from the necessary differences in language and references to places specific to the two tribes. Winter was the season for story telling. A major class of stories gave an explanation for how the world came to be as it is, recounting events in the time of the Ikhareya prior to the creation of humans. “A myth typically climaxed and ended with the coming of mankind and the simultaneous transformation of the protagonists into species of animals, or disembodied spirits, which exist on the earth today” (Bright in Heizer 1978, p. 187). As is the case with the oral literature of any culture, information contained in any given story or legend may be interpreted and considered at a variety of levels, from the entertainment of the very young hearing an account of how Coyote stole fire to deep affection for the land and its specific places immortalized in narrative. In the Foreword to Karok Myths by A.L. Kroeber and E.W. Gifford, Theodora Kroeber considers this multilevel aspect of this body of oral literature as it exists between the Yurok and Karuk.

> They delineate a like World and Way; take a like moral stance toward persons and events; follow a like pattern of story development; the story recitation is focused, vivid, formal, sure, its character and personality portraits subtle and supple. The possible psychological states are myriad, arising from shame for dishonor brought upon the protagonist by himself or by another. Pride, fallen or risen. Greed. Fear. Blazing anger. Despair. Desire. Nostalgia. In the old world of the Karok, gods, heroes, and living men wept tears, openly, without embarrassment. Mourning tears, tears of shame, tears to bring power and wealth (Kroeber and Gifford, p. xxv).

Coyote, Piniafich, is the primary trickster figure of the Karuk and appears in "the standard tales–of the Creation, of the origin of animal characteristics, natural phenomena and customs –and the Coyote-trickster cycle stories retain their earlier quality and clarity, these the durable tales remaining memory from childhood repetition of them and affection for them. (Ibid., p.xxvi).

In her introduction to Karok Myths, Theodora Kroeber addresses the manner in which the stories reflect the position of strength of women in Karuk family, doctoring and society. Recalling a canoe trip up the Klamath River taken with her husband A.L. Kroeber in 1939 or 1940, she reflects on the personality characteristic of the women who had known Kroeber from some 40 years previously.

> Among the Old Ones who had known Kroeber earlier were more women survivors than men, Mary Ike was one of them—soul-warming and impressive women they were, bright, spontaneous, expressive, humorous. Their outgoingness and naturalness were not the result of changing customs—change brought by the white man was not liberating change—but went back rather to old Karok custom in which many of the restrictions imposed on young women were lifted once a woman was no longer of childbearing capability, the contaminating and potent moon-blood fear no longer attaching to her…(Ibid. p.xxv).

Theodora Kroeber goes on to illustrate this relationship between the stories and the actual role of women in society by referencing the tale "Origin of Men's Use of Sweathouse" (Gifford II.12.).

> …it tells how in the beginning the sweathouse was the women's house, a place to keep materials for basketry, blankets, robes, and capes; bark for shredding, quills and shells and feathers for elaborate decorating of costume; findings, needles, twine, etc. It was always in a mess, until one day Coyote, tired of its disorder, took the sweathouse away from the women and gave it to the men! So much for the sacrosanct men's sweat lodge (Ibid. p. xxvii).

The Karuk love of place and animals is strongly demonstrated in these stories, e.g., Bluejay (Kachakaach) is the personification of greed, a character trait seen as particularly undesirable.

Subsistence Utilizations of the Klamath River and Upland Areas

Fishing

Kroeber and Barrett discuss the Karuk as one of a number of "core tribes" dependent upon fish within a social system of enforced rights.

> The best fishing places along the rivers were privately owned, sometimes by single individuals, sometimes jointly by several. In the latter case, a fishing place could be used by each owner in rotation, according to the proportionate share of his ownership. An owner might give someone else permission to fish there on the day or days when his turn would normally come. But no one was permitted to fish or to establish a new fishing place immediately downstream from a recognized fishing place…most inferior fishing places, and a few excellent ones were not privately owned but were open or public…(Kroeber and Barrett 1960 p. 3)

The concept of ownership applied strictly to the right to fish and not to ownership of land along the river. Gifford (F.N. 1939 p. 42) gives the example of a half mile stretch of river named pawat andjsununam (Where they start fishing for Chinook salmon) about which a Karuk "informant" stated "emphatically" that the issue was not who owned the land within which a fishing area lay, but that ownership related strictly to the right to fish. Those possessing what are still referred to as "rights" had, as was characteristic of the Karuk, degrees of flexibility in this ownership of rights. The owner of rights at a particular fishery might sell those rights in all or in part; might give away surplus fish and might allow others to fish at the site of his ownership. The concept of rights was not restricted to fishing sites but extended as well to acorn-gathering and hunting rights specific to certain areas. These rights, which had the force of law, might be attained by inheritance, as a gift or as payment for services. Women could own rights while not fishing themselves, but being fished for by a man, usually a relative.

Species of Fish Utilized Within Aboriginal Karuk Territory

The Klamath River provides a spawning area for several species of fish that were and continue to be utilized by the Karuk. These fish represent simultaneously a major food resource, the focus of ceremonies and more recently an issue of cultural sovereignty and survival.

There are five recognized species of Pacific Salmon, Oncorhynchus. Of these two the King or Chinook, O. Tschawystcha, and Coho or silver, O. Kisutch are most frequently found in the Klamath. The other three species, the red or sockeye, O. nerka, the humpback, O. gorbuscha, and the chum or dog salmon, O. keta.

Unlike the salmon of the Klamath River, steelhead, Salmonidae, are anadromous species of trout, which do not die upon returning from their life as mature fish in the Pacific to spawn in the Klamath. The Klamath steelhead are the rainbow trout Salmo gairdnerii (irideus). In aboriginal times and prior to construction of dams, including Iron Gate Dam, the relicensing of which is the reason for this study, these species spawned freely not only in the Klamath and its tributaries, but in Klamath Lake and well beyond. Steelhead appear in the Klamath River in three runs. The first of these runs occurs between Mid-April and late May.

Literature as well as oral tradition indicate that prior to an extended series of impacts on the fishery, beginning with the miners, salmon were entering the river in species distinguishable pulses throughout the year. The pulses which constitute runs mount and then decline with the progress of the run. The major run was that of the spring salmon. Snyder quotes from G.R. Field:

> As the run of winter steelheads ceases, about March 30, spring Salmon begin to come. A few enter the Klamath in the later part of February, but the run really starts in March and slackens or almost entirely passes by the last of May. These fish average about 11 pounds in weight and are indistinguishable from those which come later, except that the eggs are always immature. These spring salmon may be caught in the smaller streams fed by melting snow at the headwaters of Salmon River during the month of May (Snyder, p.19).

Spring salmon are said to "lingered" in the vicinity of spawning beds until they mature and then spawn with the fish of later runs. Spring salmon were also known as "silvers" due to their bright colors which gradually become indistinguishable from the coloration of other migrations in the period prior to spawning, having matured in the vicinity of the spawning beds. By the time of Snyder's writing in 1931 the spring run had declined from being the major run to the point that he characterizes it as being of "relatively little economic importance". (Ibid.)

The Karuk as well as other tribes of the core region recognize two runs of King Salmon. The Chinook or spring kings are the subjects of the First Salmon Ceremony, performed in coordination between the Yurok and Karuk in sequence. This fish, whose importance has raised it to the totemic level, historically spawned as far north as the Williamson River when this portion of the drainage was available as spawning grounds prior to the damming of the Klamath River and the reconstruction of Klamath Lake in its present form. This First Salmon Ceremony was conducted around April when the fish first breeched the sandbar at the mouth of the Klamath, marking their transition from the Pacific Ocean back to the fresh water of the Klamath River. As these King, spring or springies make their way up river, the Karuk mark their arrival at Amekiarum, below the mouth of the Salmon River. The spring salmon are followed by the summer or King salmon, which are larger than the spring run.

Writing with a historical perspective of changing runs, Snyder makes the following observation concerning the migratory patterns of the summer salmon:

> The summer migration of king salmon up the Klamath River begins about the first of July, mounts rapidly by the last of the month, reaches its maximum in August, declines gradually in September, and falls away almost entirely before the beginning of minter. There is no definite break between the spring and summer migrations, and it seems also that the fish in small numbers continue to appear through November and even later. A spawning migration of steelheads comes with that of the king salmon. And a run of silver salmon Starts early in September and continues through October and November. The spring migration has now lost its economic importance and seems to have almost entirely disappeared. It was formerly connected at its waning period with the summer run. The fish of the spring run enter the river during its flood height of very cold water, and pass up stream under the same conditions, while the summer migration starts as the winter and spring floods subside, most of its fishes passing upstream during a minimum flow of water…(Snyder, p.23).

In the ethnographic interviews to follow references are made to this pattern of loss of runs which were once of great vitality and supplied fish at times of the year when runs are no longer taking place.

The following summations of data concerning steelhead and salmon species are taken from a 1999 report "Evaluation of Interim Instream Flow Needs in the Klamath River" prepared for the Department of the Interior.

> **Steelhead**
> The Klamath Basin supports three runs of steelhead generically referred to as springs summer, fall and winter runs. Typically mature spring/summer steelhead enter the Klamath River between mid-April to late May. These fish migrate upstream to most of the principal tributaries including the larger creeks where they hold until spawning between January/April of the next year. Weir counts on the New River which is approximately 84 miles from the delta showed adult summer show downstream migration in mid-March, peaked in mid-April and diminished by the end of May (USFWS pers. Com.) Fall run steelhead will typically enter the River as early as July, but primarily during October and November were they hold for several months before moving to spawning areas in smaller tributaries. Winter run steelhead typically move into the River between December through February and may continue through May while migrating to their spawning areas. Approximately 16 to 22 percent of spawning steelhead are repeat spawners (USFWS per. Com.) One of the more unique characteristics of the Klamath River Basin is the presence of half pounders. These steelhead are immature (non-spawning) males and females, which are found in the summer and fall run steelhead migrations. Half pounders that enter the Klamath River generally return to the ocean the following winter or spring. After egg deposition, eggs typically incubate from 4 to 7 weeks with the fry typically emerging during March through June. The length of time for egg incubation is a function of water temperature. The

juveniles may remain in freshwater for one to three years before emigration. Emigration of natural steelhead smolts from the Klamath Basin typically occurs between March to late July. Field collections suggest that most emigrating steelhead arrive in the estuary during April and May. Although some spawning does occur in the main stem, its importance to resident life stages throughout the year cannot be understated. For example, a large percentage of wild Klamath River steelhead show two years of freshwater growth and a half-pounder life stage exists. Tributary out-migration data show that a large percentage of steelhead entering the Klamath are fry and yearlings that must rear in the main stem for an additional year or two. Half-pounders rear in the Klamath and tributaries from August-April. Steelhead prefer water temperatures which range between 7.2 and 14.4 C .

Coho Salmon

Coho typically migrate into the Klamath River during mid-September through mid-January. Upstream migrations are typically associated with pulse flows due to fall rain events. Although Coho primarily spawn in tributary streams from November through January, they have been observed spawning in side channels, at tributary confluences, and suitable shoreline habitats along the main stem. Egg incubation lasts approximately seven weeks and typically occurs during November through March. Alevins remain in the gravel approximately two to three weeks and then emerge as free swimming fry during February to mid-May with the peak in April and May. Coho will typically rear in freshwater for one year before emigrating to the ocean. This usually occurs in the spring following the first winter. Out migration can begin as early as February and continue through mid-June, with peak numbers arriving in the estuary during April and May. Optimal temperature ranges for Coho are 3.3 to 20.5 C, although preferred rearing temperatures are 12.0 to 14.0 C. Upper lethal temperatures have been reported as 25.6 C.

Chinook Salmon

Spring Chinook salmon typically enter the Klamath River as early as February through the Month of July. Peek immigration has been reported as occurring from March to mid-June. Migrating adults tend to hold in deeper pools of the tributaries where they remain throughout the summer before spawning in the fall. Spawning may occur from September through mid- November. Spring Chinook spawning in the Salmon River occurs from mid-September through mid-October. Spring Chinook are generally believed to migrate farther upstream than the fall runs. Once the eggs are deposited incubation generally occurs from 40 to 60 days. Alevins and fry remain in the gravel for approximately two to four weeks and begin to emerge during December. However, USFS emergence traps on the Salmon River show emergence extending into late May. Optimal incubation temperatures range between 4.4 and 13.3 C. Spring Chinook will typically hold in freshwater for approximately one year with emigration generally occurring through March to

July although USFS Salmon River outmigration traps show that spring Chinook smolts emigrate during fall and spring months. Typical rearing habitats for juvenile spring Chinook are runs and pools. Optimal temperature for juvenile Strong Chinook ranges between 13.9 C and 19.4 C. Upper threshold temperature for juveniles has been reported as 25 C.

Fall Chinook are typically separated into two runs, fall and late fall runs. The fall run enters the Klamath river from mid-July through mid-October while the late fall run occurs from November through December with some as late as February. Fall Chinook spawning occurs throughout the lower reaches of tributaries with less than one-third of the total fall Chinook run utilizing the main stem Klamath River for spawning. Although approximately 50 percent of the main stem spawning occurs in the upper 13 miles, significant spawning occurs as far downstream as Happy Camp at river mile 110. Spawning, in limited numbers, has been observed downstream as far as Orleans. Egg incubation generally requires 50 to 60 days at water temperatures which range between 5 C and 14.4 C. Some have reported emergence water temperatures which range between 5 C and 14.4 C. Some have reported emergence of the fry from the gravel during the November to February period. However, Klamath River main stem spawning and temperature data collected by the USFWS in 1993 and 1994 was used to predict emergence timing for the 1994 and 1995 water years using daily temperature units. Emergence from the 1993 run began in early February and peaked in early March 1994. Emergence timing in the tributaries is believed to be earlier than the main stem. Due to different life history strategies, outmigration of natural Chinook is year round. Type I Chinook outmigrate in the spring and early summer months. Type II outmigrate in the fall and Type III hold over through the winter and migrate in early spring (Sullivan 1989). The majority of Klamath River Chinook outmigrate using the Type I strategy. Mid-Klamath River Tributaries such as Elk Creek have a Type II strategy. A wet and cold spring can cause a peak shift of the peak outmigration up to one month and later than a dry warn water year. Young of year Chinook outmigrating through the Big Bar trap subside in early August. Shasta River Chinook outmigrate from late January through early May. The secondary pulse should not be confused with the fall, Iron Gate release (pp. 5-7).

Sturgeon and Eel

Two species of that ancient fish the sturgeon, the white sturgeon, Acipenser transmontanus, and the smaller and less numerous green sturgeon, A.medirostriu (acutirostris) are anadromous species which migrate as far up river as Ike's Falls, some one mile below the mouth of the Salmon River, where they are forced to stop by the presence on unbreechable falls.

The Pacific lamprey eel, Entosphenus tridentatus**,** is a much esteemed food source and like the salmon ascended to Klamath Lake in their spawning migrations.

Karuk ancestral territory is also home to two species of freshwater, non-anadromous sucker, the Klamath coarse-scale sucker, Catostomus snyderi, and the Klamath fine-scale sucker, C. rimiculis.

Gifford cites a Karuk as listing the principal salmon species as:

> 1. Chinook, King, spring, or black salmon: pawat, pavat (the nam, binui ama, "summer salmon," may be a translation from English). This was recognized as a large, dark-skinned fish with pale pink ("white") flesh and was the most esteemed species. It appeared in spring and continued through fall. Before the spring run, these fish were referred to honorifically as inenyara, which naming helped induce them to come in numbers. The first arrivals were call ixyats, but might not be eaten until after the ceremony made for them at Amekiarum. This was the species for which lifting-net scaffolds were set up, though in creeks it was harpooned.
>
> 2. Coho or silver salmon (also sometimes locally called dog salmon): achawun or ichwon. It was very red-fleshed, rather dry, not fat. The run began late, in October.
> [The three other species of Pacific salmon were not mentioned, no doubt because of their rarity.]
>
> 3. Steelhead: sa'ap. In winter, at high water, they continued to be taken with platform lifting nets after the salmon completed their runs.
>
> 4. Trout: ashkup, were in the river and creeks the year round.
>
> 5. Suckers: chamuxit. Bony, not considered too desirable, but available the year round.
>
> 6. Bullheads: xantiit, are probably the catfish introduced by Americans. [Hewes gives the name as hanket and says they were chiefly caught in winter with dip nets.]
>
> 7. Sturgeon: shikihas, ishrixihara, the later alluding to the rough skin. Occurs upstream only to Ike's Fall[s], which it cannot hurdle; but the Karuk say it fears an enemy above there and turns back. Sturgeon were caught in a strong-meshed lifting net. The flesh was considered less good than the salmon, and there were no special formulae or ceremonies for sturgeon (Kroeber and Barrett p.6).

Fishing Methods

The several species of fish utilized by the Karuk were taken by a variety of methods depending on the section of river or stream, the nature of the flow and the species of fish. Hewes (1942 pp.97-98) list includes: single and double-pronged toggle harpoon, gorge hook, double-pointed angle hooks, V-frame dip net (large), multipronged spear, gaffs, basketry traps, fish dams, and hoop nets.

Weirs

According to Mary Ike the Karuk built weirs at the following six locations over a distance of 25 miles of river, with only one weir being constructed per year, an indication of the labor-intensive nature of the undertaking (Gifford, F.N. 1939-42; names added by Kroeber, 1936). These locations, in descending order on the Klamath River, were as follows:

> Above the mouth of Irving Creek "below the Sancho mine." (The Irving school is between 9 and 10 mi. upriver from the mouth of the Salmon.)
> On lower Salmon River, below the [old] bridge at Somes Bar. (Probably Shakirpak or Shihtira, a fraction of a mile from the Klamath.)
> At Oak Bottom Flat. (This is Vunharuk, something over a mile above Somes Bar, about two and a half miles up from the mouth of the Salmon, and about a mile below where Wooley Cr. Flows into it.)
> Back on the Klamath, at Orleans (Paniminik) something over seven miles below the mouth of the Salmon).
> At Tuyuvuk, Ullathorn Creek and Bar (not quite 3 mi. below Orleans).
> At Wupam, (Red Cap, abut 4 mi. below the last; it was the most downriver of Karok towns).

Georgia Orcutt named an additional three Karuk weirs.

> Aft ram, at Stanshaw Creek.
> Afsuf, the creek next below Camp Creek, on the same side.
> At Forks of Salmon (exact location uncertain).

This last named Weir at Forks of Salmon is of particular interest as it indicates the close level of cooperation, and something of the relationship between the Karuk and the Konimihu of the Forks of Salmon area. Kroeber and Barrett discount the reference to a weir located at Forks of Salmon as "a loose statement," indicating a location "somewhere up the Salmon" or as a misstatement pertaining only to the post-contact period. This was a time following the virtual extinction of the relatively helpless Konomihu in which the Karuk indisputably began inhabiting the Salmon River well up the South Fork of the Salmon River past Forks of Salmon. In fact, according to oral tradition of the Karuk, there was a longstanding relationship between the Konomihu and the Karuk. The Konomihu, lacking the numbers to construct a weir on their own, as they lacked the wealth to hold their own ceremonial dances, relied on a close level of cooperation with the more numerous Karuk people. This relationship is seen as well in the alliance between the Konomihu and Karuk in defense against incursion by both the Hupa and the New River Shasta (Personal Communication, Leaf G. Hillman 1997). This relationship indicates that Karuk interests did not end with the last Karuk village upriver from the mouth of the Salmon River.

The ceremonial significance of two weirs may be gauged by the coordination between their construction and accompanying ceremonies. The weir at Afsuf was built following the Jump Dance at Amekiarum in July. At this time the Fatawanun spend four days fasting and praying in the sweathouse at Paniminik. Similarly construction of the weir at Wupam (Red Cap) was attended by the Fatawanun spending five days in the sweathouse (Kroeber and Barrett p. 20). Construction of the other weirs was unaccompanied by ceremonies, although a girl's puberty dance, the Flower Dance, was customarily held following construction of the remaining weirs.

In their mythological origin, Weirs were created by one of the immortals (Ikhareya) as an aspect of creating salmon and preparing the structures and techniques that the humans to come would use in their capture:

> When he had made the salmon, this ikhareya made what the Indians use: he made the scaffolding to fish from. He made it of long poles. He bruised grapevines with which to tie the poles and made it all good. He thought, "This they will do when they fish." He laid a plank on the poles to fish from, and on this he put a little stool so that they could sit while they fished. He thought he had made everything. Then after a time he thought, "It is not quite right as I have made it." He put a screen of brush at his fishing place. He concluded, "It is not right like that. It is too far out in the stream. Let it move back a little toward the shore." Then he thought, "It is not right yet. I do not think it will be good if I use brush. I do not want the salmon to go through: I want them to go right where I am fishing with the net. Let me make something flat and even." So he made a weir ("dam") of sticks and tied them together with pounded twigs (into a mat). Then he thought, "Now I think it is good as I have made it. Now when the people grow they will do that. It is a good way I have made it now." So now the people do like that. When they grew they saw what he had made (Karuk Myths, Kroeber 1980 pp 71-72.)

Karuk weirs took around two weeks to construct, including preparation of the poles and logs. Once in place, the weir was left until removed by high water. Weirs offered the advantage of allowing a winter's supply of salmon to be caught for many families. During their period of use men were engaged in fishing and women would prepare and dry fish for storage.

Fish Nets

The aboriginal Karuk utilized both large lifting nets requiring platforms and a trigger string called uripi, or in its larger form, up to twelve feet, amvauripa (Hewes F.N. 1940).

The dip net or plunge net (takika) is still in use. This form of net is used at the only authorized fishing site reserved for aboriginal Karuk fishing at Ishi Pishi Falls. The net is utilized from a shelf of shoreward rocks or boulders and is plunged into pools just below the falls where salmon rest prior to making their way up the falls. Both types of nets were woven of fibers extracted from the leaf of the native iris iris macrosiphon (apkas). Characteristically

there was a gender-based division of labor with women extracting the two fibers found in each leaf using a muscle shell fitted into a leather holder and set on the processors thumb. In turn, men twisted the fibers into cordage, which was then woven into nets.

Basketry Traps

One technique of fishing high-water creeks in winter utilized trough-shaped basketry traps called pisimvaru, referring to the bent up sides. Larger traps were constructed of split spruce poles "each six or seven feet long and set several inches apart." (Ibid.). With widely spaced longitudinal poles these traps captured only the larger species, salmon and steelhead while smaller, similarly constructed traps were used to take smaller fish such as suckers and trout. These traps were laid open end downstream in line with the water flow so that fish swimming upstream passed unimpeded into the trap from which they could not escape and were removed once a day with the trap being left in place. In style, this fish trap resembles a Karuk bird trap, which the prey enters unimpeded but finds no exit. Hewes also reports that ordinary burden baskets were sometimes called upon as scooping fish traps. Driver includes in the list of Karuk fish traps "a half-cylinder type of trap and…another…pointed at both ends…. (Driver (1939, pp.313, 379).

Lamprey eel continue to be valued as a rich source of fat and are taken by a variety of techniques including small-meshed nets, gaffs and by hand, now utilizing a glove for a better grip as the eel work their way over rocks at night in their upriver migration. In moonlight nights the eel's slime coat is easily seen sparkling in the moonlight. The eel trap is made of an open weave basketry anchored in place by rocks as well as line. This trap takes advantage of the eel's tendency to move at night and hide by day in gravel. Gifford (F.N., 1939-43) reports that at Ikes Falls eels were taken by an ingenious strategy of frightening them to loosen their anchor grip on rocks and be swept into nets.

Gaffs are also used to take eel, both aboriginally and currently. The current implement of a large fishhook lashed to a short handle closely resembles its predecessor that utilized an angled point of bone or antler similarly attached to a gaff handle. While both the Yurok and Hupa used eel pots, the ancestral Karuk did not. This was accounted for in a story explaining the specific taboo of this device.

> …It was not used by them [Karuk] because its use was tabooed by their Ixkareya girls…whose fish dam was spoiled by Coyote. Two of these girls are now white rocks on the mountain above Ashanamkarak. The third sits bent over at the north edge of the Klamath lagoon entrance at Requa. The use of the eel pot by the Karuk would cause famine: "It would make everything grow scarce" (Ibid.).

This myth is notable not only for its characteristic mythological chartering of cultural activities, but as another instance of an awareness of the river as a cultural landscape passing through several tribal landscapes.

Fish Harpoons, and Other Devices and Methods

Harpoons are distinguished from spears by the presence of a detachable head fixed to a foreshaft or directly to a mainshaft. The head is attached to the foreshaft or mainshaft by a toggle line that held the speared fish and acted as means of cushioning the shock of a fighting fish, much like the springiness of a modern fishing rod allows fish to be played without tearing out the hook. Harpoon styles consisted of both double and single toggle points.

In one of a series of creation stories that present logical accounts of the origin of humans, institutions and tools, Chukchuk, Osprey or Fish Hawk considered needs and developed solutions, a very Karuk process. In this series of origin accounts, Chukchuk develops the two-pointed harpoon as a means for those to fish who did not own rights to one of those previously referred to sites at which large numbers of fish were to be caught by a variety of net techniques.

> He took a long stick. At the end of it he fastened two small ones. He thought, "I will spear salmon. Let me make that kind. Let me make it so that if a man has no fishing place and he sees salmon he can catch them. If he has no net he will kill them in this way." So now if people own no fishing place they spear salmon. Chukchuk was the one who made it thus (Kroeber, 1980 p. 72).

Due to the efficiency of nets and weirs in the harvesting of large numbers of salmon, and the flexibility of fishing rights which provided for gifting distribution as well as allowing those with no "rights" to fish, the harpoon was utilized as a secondary harvest technique and was used in the capture of steelhead in their spring spawning runs up streams too small to allow netting as a strategy (Hewes, F.N. 1940). Similarly fish were sometimes taken with bow and arrow (Driver 1939: pp. 313, 379). Hewes (F.N., 1940) reported that Karuk sometimes took sturgeon by means of a twisted grapevine noose slipped over the fish's tail which was then tied to a tree as these giant (eight to nine foot long, 200 pound plus) fish were too strong to be held even by more than one man.

Hunting

Deer (Puufich-Odocoileus hemionus) were among the most prized game. Their pursuit required many ritual acts of psychological, sexual and personal purification designed to prepare the hunter's focus and intent. These acts included "sweating bathing, scarification and bleeding for luck, by smoking his weapons with herbs, and by fasting and sexual continence" (Bright, 1978 p. 181). Deer were so much a part of Karuk life, legend and sense of correct cultural behavior that Bessie Tripp recalled her grandfather telling her that when deer and bear came down to the river, the day of the Indian would be over forever. This observation relates to the Karuk use of fire to create grassy areas known as "prairies" in the upland regions which served to draw and concentrate game, including deer and their predators, particularly of the fawns, bear, to these regions of grass and browse in the otherwise dense forests of the area. Her grandfather's statement was a reflection of the knowledge that these open areas were cultural constructions, the consequence of utilizing fire to shape the natural environment in a wide variety of ways, and that their conclusion could

only mean a disaster had been visited upon the Karuk, interrupting their most profound cultural patterns. Her sardonic comment was, "…and I've seen it happen." (Personal Communication 1977).

Those high country deer taken from the prairie areas were considered to be far superior in their flavor and size to the deer which, since the forced cessation of controlled burning, have begun feeding on flats adjacent to the river and are referred to somewhat derogatorily as "poison oak deer." Deer were taken in a variety of manners including being driven by dogs, snared, stalked, and waited for in ambush. Following a kill, the deer was spoken to in a manner so that its spirit would return to the spirit world to tell the other spirit deer that it had been treated with respect. This act would encourage the spirit deer to offer themselves to men when their time came.

Black Bear (Virusur) were hunted in winter when they could be found in their dens, often detected by the small hole which remained open in the snow due to their body heat and which allowed fresh air to circulate. Johnny Bennett recalled that sometimes the bear were killed in their dens rather than risk waking the animal by dragging it from the den. In this strategy the hunter would slowly saw a sharp knife across the bears throat until an artery was cut. Johnny warned that this particular strategy did not work with Grizzly bear as they would wake from hibernation and kill the hunter (Personal Communication 1978).

Gathering

While hunting was the work of men, women processed salmon, gathered wood for cooking and gathered a wide variety of food plants as well as basketry materials. Acorns of the tan oak (xunyeip-Lithocarpus densiflorus) were considered the most desirable of those available to the Karuk, although the Sadler's Oak (yawish-Quercus sadleriana) called the sweet oak, had the singular virtue of not requiring processing prior to consumption. Other species of acorn required being ground into flour before being put through a leeching process to remove tannic acid. The relative plenty of the Klamath basin has led to a fictional sense of overwhelming plenitude which could be counted on to carry a stable fixed population with ease. While there were good years, there were certainly hard years as well in which every opportunity had to be seized. Bessie Tripp reminisced about wanting a traditional tattoo as a young girl, but being unable to afford to pay the price of a dried salmon to hire an older woman to aid in the ritual requiring a round-trip walk of sixty miles. These tattoos are best remembered as three vertical bands running from the lip and down the chin.

> Almost everybody had that long time ago, tattoos. Somebody said, "How come you didn't have one?"
>
> "Oh," I said, "I wanted one so bad but I had no one to go with." It was way up there, where they used to walk up, up to Happy Camp (40 miles) with a woman. I couldn't go up there, 'cause I had no one to take me up. You know you couldn't get nobody to take me way up there, you know, walking. It had to be you. . .something, maybe you grandma or you mother. I could have made it, but there was no one to go way up there. My grandma would say, "Maybe this

> fall," we had no money to pay, "Maybe this fall we can give a dry salmon" (in payment) but we just never did have it made.
>
> Oh yes, they used to make it [using] that white rock. What they call it? Quartz, I think it is, crack it off some of it, use soot for dye. Go in a sweathouse; get fine powder like . . . (soot). Some of the small ones [were] beautiful. Some of them had them taken off after that [custom went out]. I know two ladies had them taken off. Then older people used to have them [down their] legs, for their beauty I guess. Just nice marks, little bit of things, on both sides of legs, and on the arms. Almost everybody had that (Ibid).

This personal account is of value for the light it casts upon the often-storied plenitude of the Karuk, Yurok and Hupa that allowed them the leisure time unavailable to tribes occupying less environmentally rich territories. In fact, as may be gauged from the above account, the Karuk people lived in a circumstance that encouraged thrift, application and cooperation to live on and manage the land in such a way as to sustain stable populations. Along these same lines, Mary Ike named late winter month called piswaxan is as the time of pitivaraiwa, "looking around house in vain for food." (Kroeber and Barrett, p.9).

Together with dried salmon, acorns provided nutrition through the long winters of the Klamath River when fresh plant foods were generally unavailable. Acorns were collected throughout the fall from established gathering areas, many of which, in keeping with Karuk husbandry, were considered the gathering areas and even specific trees of families and individuals. The Karuk burned carefully under tan oaks for a variety of reasons. Fire killed the insects that parasitized the acorns, cleared the duff around the trees to make gathering easier. The scorching of the tree's lower bark and accumulated ash increased subsequent harvests. A favorite means of processing involved placing the whole acorns in a hole adjacent to a stream or spring through which water slowly percolated, leeching the nut meats within the shell and resulting in a soft, black acorn called peesh which could be consumed without further processing. Acorns were eaten as mush, soup and cooked into a flat bread on a hot flat rock. The Fatawanun or Medicine Man may sustain himself in the course of his arduous ceremonial activities by drinking a diluted mixture of acorn soup called "acorn water." Additionally, a wide variety of seeds, nuts, bulbs and greens were gathered for food. Some 150 culturally utilized plants are catalogued in "Plants and the People: The Ethnobotany of the Karuk Tribe," (1991).

Baskets and the complex technology involved in the gathering and preparation of a range of materials great cultural importance, playing a significant part in the role of Karuk women and remains an important cultural activity. Here too, the cultural practice of controlled burns played a crucial role in producing the long, straight hazel twigs required for basket warps. Other significant materials included a variety of pine roots, willow (pa'arel-Salix hindsiana), Bear Grass (panipira-Xerophyllum tenax) as well as blue willow, and Woodwardia (tip tip-Woodwardia fimbrita) and other ferns.

Indian tobacco (avarhaira-Nicotina bigelovii) was the only plant cultivated by the Karuk prior to the arrival of whites and the introduction of seeds and the broader concept of gardening for vegetables and planting of fruit trees. Indian tobacco seeds were sowed in rotted logs. Many people avoided wild grown tobacco saying it may have grown from a grave.

Ceremonies

As the purpose of this White Paper is to examine the effect of Iron Gate Dam on the cultural and natural resources of the Karuk Tribe, and as the details of the major Karuk ceremonies have been described in detail in Kroeber and Gifford, these ceremonies will be discussed in the present context for the insights they provide into the cultural life and underlying values of the Karuk, and in their linkage to the other tribes of the river in a shared cultural complex, an ethnographic riverscape. In one aspect, the ceremonies, as with other aspects of traditional perspective are reenactments of acts of the Ixkareya or immortal ones. In another sense these ceremonies go beyond symbolic reenactments and are themselves metaphors for close and careful husbanding of resources, of hard work, of making your own luck in the tradition of Karuk individualism and of the closeness of resources available to the people, even with the most careful of ritual observations.

The Karuk are known among Indian tribes of the western United States as "the Fix-the-World People." This term is derived from the annual Pikiavish Ceremonies, commonly referred to as the World Renewal Ceremonies. This sequence of ceremonies is shared by the Karuk with the downriver Yurok and Hupa Tribes. The timing of the Pikiavish was related to the fall salmon run and at the time approaching the acorn harvest. The dance cycle is determined each year by a ceremonial leader or headman who also appoints the Fatawanun or Medicine Man for that year. This appointment is at the same time a source of honor and a great labor as the Fatawanun is required to undergo a lengthy ordeal which includes fasting, praying, and walking the Medicine Trails.

Traditionally the Pikiavish was preceded by the Jump Dance held at the Dance Village of Amekiarum a short distance downriver from Katamin, site of the White Deerskin Dance. The Jump Dance was held at the time when the spring salmon began their run and was initiated by the First Salmon Ceremony.

Powers gives the following account of the First Salmon Ceremony:

> …They celebrate it to insure a good catch of salmon. The Kareya Indian [priest] retires into the mountains and fasts the same length of time as in autumn. On his return the people flee, while he repairs to the river, takes the first salmon of the catch, eats a portion of the same, and with the residue kindles the sacred smoke in the sudatory. No Indian may take a salmon before this dance [used in the sense of a ceremony] is held, nor for ten days after it, even if his family is starving (Powers p. 31).

Although the Pikiavish is an annual ceremony whose conclusion marks the Karuk New Year and is celebrated with great joy and feasting, the Deerskin Dance is held on years alternating

with the Medicine Dance during which other decorated skins including martin and otter are displayed rather than the famous white deerskins. The Karuk ceremony has three major aspects.

> The first is a period of usually not more than ten days during which the priest remains much in the sweathouse, fasts, and prays for abundance of food, the elimination of sickness and the stability of the world. He also visits sacred spots; and young men engage in archery contests. The second part is the climax of the ceremony, when the priest keeps an all-night vigil by a sand pile called yuxpit. This vigil is accompanied and followed the next day, by the Deerskin Dance, or its surrogate, an imitation affair employing branches instead of deerskins; at Inam and Katamin the War Dance is part of the dance ritual. The third part is the anticlimactic retreat of the priest and other officials (Kroeber and Gifford p.6).

The archery shooting aspect of the Pikiavish referred to in the above statement is a contest of shooting at a small fork shaped target (yuxpit) set in front of a screen of fir branches and which is often hidden from the shooter behind brush or shrubs, requiring that the shot be angled up sharply so that the falling arrow will land vertically, as the goal is to "wake up the earth" for Pikiavish and the new year. The occasion of arrow shooting is one of prayerful concentration followed by exuberant competition with small bets being placed on each shooting. The winner of a match shoots first in the subsequent match and then goes to a place where he can call out to the remaining shooters where their arrow has fallen in relation to the target. On subsequent days the archers move from location to location, in the sequence preordained by the Ixkareya. In acts of abstinence, concentration and purification reminiscent of the purifications required for deer hunting, the arrow shooters fast from the previous night, neither eating nor drinking water. Following a prayer by the Headman which includes a statement propitiating health "even for the creatures that crawl," the shooters make medicine (bidish) using a pinch of tobacco crumbled into a medicine fire and making a war cry in the direction of a sacred peak designated by the Head Man while uttering a phrase in Karuk calling for a long life.

One of the earliest accounts of the World Renewal Ceremonies is that of Stephen Powers (1877). In the following statement Powers simultaneously sets forth the ideas central to these ceremonies, their emotional sensibilities and the unity of the Karuk, Yurok and Hupa, as well as other tribes joined in this occasion of paramount ritual, celebratory and ecological significance.

> The first of September brings a red-letter day in the Karok ephemeris, the great Dance of Propitiation, at which all the tribes are present, together deputations from the Yurok, the Hupa, and others. They call it sif'-san-di pik'i'a'vish, (at Happy Camp, su-san-ni nik-I-a-vish), which signifies, literally, 'working the earth." The object is to propitiate the spirits of the earth and the forest, in order to prevent disastrous landslides, forest fires, earthquakes, drought, and other calamities (Powers, p. 13).

Georgia Orcutt captures the emotional nature of the Pikiavish as follows: “At the beginning of the Pikiavish, it looks like everything down, nobody happy. Pikiavish means making the world right. Fatawanun fixed it so everything is coming up nice (Kroeber and Gifford p.8).

In the following statement Bessie Tripp recounts making medicine and serving as the Ahup-Pikiavan (wood maker), wood gatherer for the Fatawanun during the First Salmon Ceremony. Laced throughout this account are the elements of individualism, hard work, conservation of resources and a sense of the consequences of wasteful or incorrect behavior characteristic of Karuk culture.

> I made medicine down across the river. That's about the hardest thing I ever done. I never eat; never drink water, [for] two days. And they tell me I have to sit there, look at one corner [of the river] all day. Not supposed to sleep, because I won't live long if I go to sleep. Oh, I was tired and sleepy and thirsty. You prayed for everything…fish…that's why I had to look at one corner across the river there. Wishing how the fish would stop there and not go up straight, and acorns, and how the kids gonna grow up--no sickness, old people, all that. It was just about the hardest thing I ever done. I didn't go to sleep because I wanted to live long time.
>
> Then I went to get wood on this side of the river. Just medicine men, two of them [were], there too. [They] were the first ones to eat the salmon. Before that nobody eat, till they eat. After that, then everybody eat. And I have to cut the wood for that [fire], have to cook the fish. I don't know how far up I went [up] the hill 'till I found a nice dry tree. I had, I don't know, some kind of horn, elk horn, and a rock where I could hold it, big end down here, small end up. I put wedge in crack (makes pounding motions), 'till it crack open, put it in somewhere else 'till the tree fell. And I had to pick up all the . . .oh, there was a man with me. He had ax, [to] chop it all up. I put it in my basket. I had to pick up all the little sticks. They tell me too, if I didn't, there would be all kinds of bugs (chuckles); you know, just everyplace, bugs.
>
> So I had to pick up all them little sticks, limbs. And he told me to tie that up with a hazel bush, put it on top [of a pack basket]. So I did. "And don't you talk!" (said in a harsh, man's voice). And that was his first words to me. [After that] he just talk all the way [back], say all kind of funny things. He want me to laugh, but I won't laugh. I never even look back at him and I tote that wood down the hill by the river.
>
> When I got back they told me I had to sit there in the hut. There was a sweat house there with about 30 or 40 of them in there, the men in it, and they told me when I hear them singing that's when the medicine man go. You know they (medicine men) walk like that . . . (she places her hands in front of her to indicate long straight firm strides. On alternate steps the leg goes down so

that both knee and foot touch the ground.) Long steps. Pretty soon I hear, "poom…poom". That's when he's making medicine. I sit there all day. They told me that somebody will hit the house. "Then you can look around," then I can look around. So somebody hit the house. And pretty soon I hear them singing in the sweathouse. They're all singing the medicine.

Then the medicine man was coming back again and I hear that walking (drumming) "poom...poom" back there and they quit singing when he got back to the sweathouse.

And the fifth day I had to go get some more wood again, and the last thing they tell us [was],"Don't you talk" (said in a soft, counseling voice). [There] used to be a lot of pigs and they (he) saw them, a pack of pigs down there. I know I heard him throw an axe down there. He chased them pigs and I finally heard a pig squealing way down the hill. I keep on walking; I never look back. I keep on walking (a note of mild outrage). Pretty soon he caught up with me. He throw a pig in my basked, [and] upset all my tools and everything (the wood).

I didn't look back; I keep on walking. He was gone for a long time. He caught up with me a ways up the hill. He said, "Here's your tools. You meant to throw them away." (She imitates the rough voice of a man.)[I] never look back.

In the evening I told what he was (had been) doing and his mother holler at him. I says, "You know you ain't supposed to make fun of what they doing." He laughed and said, "She big shot." He says, "I bet you live long time." I says, "And you be dying soon, [for] making fun of that medicine." And he did, he died young.

The first day they start down where the store is now. That's where they start. The next day, cross the river. The next day on this side, here and there. They never eat 'till we come back from when we was shooting the arrows for our luck, shoot at a mark. There was a lot of people shooting arrows. And maybe a bunch of girls, maybe twenty of us; we all sitting there. We never eat all during that before Pikiavish. When we come back we took a bath then we eat. We was doing that for our own luck. Everybody, lots of girls and boys. We had that sometimes ten days, sometimes not ten days. That first night, . . . was evening, Pikiavish started in the evening, but they had been hiding all day. Then they holler not to hide. We all look around. Oh there be lots of people sitting around there, lots of people from up the river, down the river, even from Etna. Everyplace.

Well, then pretty soon they say, "Hurry, hurry the medicine man gonna come up." Pretty soon we see the medicine man coming. Two ladies came up from

down [at] the river. Then the medicine man he gets up there]. Then he's taking long steps. They lots of people and they say, "Hurry up, the medicine man's gonna come up" and they dance there. Like the deerskin dance, but they didn't have no skins, just brush.

And the medicine man took a long step. He was all painted up, red and black (she motions with her hands indicating a wide black strip across the eyes). Oh and there be lots of girls, maybe twenty, [or] thirty of them, boys and girls. They all marked up like that, black and white, red. And when they get to the end of that dance, the medicine man he jump up and run just as fast as he could run. And all these girls and boys, up the hill they go, fast as they could run. (She chuckles) And they go up there where the medicine house was. All night they keep that up. They got beads on the Injin dresses tinkling all night. And in the morning the two ladies have to pack in acorns, and they run with that (she chuckles). I don't know how they didn't spill it. I always wondered.

When they taking that long steps that's when they making that medicine. Praying for everything. And he's (the medicine man) got to stay in for ten days after Pikiavish if it [was] the first time you been medicine man, but if you [had] done it before, it [was] maybe only eight or seven. But I only seen that two (times) the way they used to do [it]. After that they didn't do it right, not even the medicine man. [Not doing it right in this case refers to the Medicine Man being paid, in silver money following the years around 1890.]

I used to hear old people talking, terrible people down where I was living. They said whenever they quit doing all that Pikiavish medicine down there everything's going to cave off; There won't be anymore luck for that place. Well I see that has happened.

I'm walking yet because I believed everything they told me. I was doing it for my own luck and that's why I'm living yet (said emphatically). I always believe everything they say. If you don't do it, you won't live long. They had lots of believing (Salter 1981).

Kroeber describes as follows the Flower Dance held for adolescent girls at the time of their first menses.

The dance was made at night to keep the girl awake…For 10 days she ate no flesh and drank no water, might not look at the sun or sky, could not touch water to her face. Each morning she carried to the house 10 loads of wood cut by a female relative. On the last day she emerged early and ran back and forth 10 times, motioning at the morning star as if to catch it, and asking it to give her long life and many dentalia. The entire observance was repeated twice subsequently (Kroeber, handbook, p. 106).

Curing

Curing fell into two classes of doctors and practices of curing. Herb doctors were either men or women and utilized herbs in their practice. Herbal medicines were administered internally or as in the case of tobacco by fumigation combined with the recitation of a magic formula. These practitioners were qualified simply by knowing what to do. The other class of doctors, sucking doctors, were usually women and the power to become a sucking doctor arose from deep psychological and personal origins. "When a girl continually dreamed and mourned over dead relatives, neglecting her food and acting strangely, she could be considered a novice doctor, and a "doctor dance" or "kick dance" could be held in a sweathouse for 10 consecutive nights" (Bright in Heizer ed. 1978 p. 188).

Certain doctors were also clairvoyant, able to locate lost objects or to predict the future. Mavis McCovey discussed her training to be a doctor which in part consisted of sitting around with older women who were doctors who would make subtle gestures, as with the eyes or chin, indicating social interactions and individuals for her to observe as she learned to "read" the prospective patients. In her account, these established doctors seemed to think that learning specific herbs to utilize in treatment was a simple matter compared to learning to understand the deep psychological state and needs of patients so as to be able to provide a level of treatment which addressed underlying issues (Personal Communication 1997).

II. Ethnographic Interviews

Ethnographic interviews were conducted by the author of this paper with Ron Reed, Cultural Biologist for the Karuk Natural Resource Department participating in many of these discussions. The interview process was facilitated by offering each interviewee the following inventory of possible issues relating Iron Gate Dam to effects on Karuk Cultural and Natural Resources.

1.0 Klamath River Ethnographic Landscape (Klamath Riverscape)

Where does your family come from? What is your age?

2.0 **Natural Features** Water

Water quality-turbidity-clarity-more or less now as compared to days before Iron Gate Dam?
Algi-more or less; when
Was the bottom mucky as it is now?
What were low summer, winter spring flows then as compared to now?
Are low flows degrading the fishery?

2.1 Fish

Timing of the runs-then and now-size of runs; At what point did you notice a reduction in runs or change in timing of runs?
Were fish always caught at the time of year they are now?
Eel larva numbers-then and now
How do the various fish and eel populations compare now with pre Iron Gate days?
Gravel Bars
Rock Promontories/Rock Canyon Walls
Willow/Riparian
Riverside Vegetation
Upslope Vegetation

2.1 Cultural Features

Ceremonial Grounds
Boat Ceremony
First Fish
Bathing
Visual
Fishing Places
Net Setting
Scaffolding
Eel Basket
Fish Weirs/Dams
Rock-Based Practices and Location
Gravel
Cooking Rocks

Porch Rocks
Rock Promontories/Rock canyon walls
Death Rocks
Rock Art
Gathering/Botanical
Willow
Spruce Roots
Tobacco
Habitation
Village Sites
Have village sites eroded in your observation? Where and when?
Fish Camps
Cemeteries

2.3 Other Features

Up-slope
View shed/Coverage
Botanical Gathering, Subsistence and Medicinal
Transportation
River - Boat
Riverside trails
Comunication
River Morphology
Oral History
How the River (Or Associated Features) Came to Be
Traditional Etiquette/River (Or Associated Features) Management
Relations With Up or Down River Neighbors
River Languages

Interviewees

I. Vera Arwood
II. Earl Aubrey
III. Laverne Glaze
IV. Norman Goodwin
V. Grant Hillman
VI. Leaf Hillman
VII. Harold Lewis
VIII. Mavis McCovey
IX. Scott Quinn
X. Toz Soto
XI. Ron Reed

XII. Phil Sanders
XIII. Ora Smith
XIV. Rene Stauffer
XV. Harold Tripp

The following inventory of **Issues Raised in Interviews** is coded according to the number assigned alphabetically to those interviewed to indicate when topics are addressed in the text of these interviews. In many cases, individuals referenced subjects more than one time.

Issues Raised in Interviews

Basketry Materials I, VIII, XI, XIII,
Changes That Would Benefit the Fish V,
Controlled Burns and Basketry Materials III, VII, VIII, XII,
Creeks XI,
Cultural Continuity Between Tribes of the River Corridor V,
Dam Removal IV, X, XV
Eel II, III, VI, VIII, XIV,
Effect of Iron Gate and Other Dams I, II, IV, VI, VIII, IX,
Effects of Iron Gate Dam on Ceremonies V, XI,
Effects of Iron Gate Dam on Cultural Resources VI, X,
Effects of Klamath Project IV
Fish Kills V,
Fish Passage IX, XV
Fishery Politics and Sovereignty VI,
Floods VI, VIII, X,
Forest Management II,
Gemorphology X, XI,
Historical Changes IV,
Indian Land Management XIII,
Iron Gate Relicensing V,
Klamath Project I, II, IV, V, VI, VIII, XV
Klamath Sucker Fish VI,
Memories of Previous Fish Runs and Water Quality I, II, VIII,
Mining Impacts VIII, XII,
Mitigations VI,
Natural Processes V, VI, VIII, X, XI,
Population Pressure VIII
Pollution VIII,
Relicensing Iron Gate Dam VI
Riparian X,
River Health
River Morphology VI,
Roads V, VI,
Salmon and Steelhead II, III, IV, V,VI, VIII, X, XI, XIII, XIV, XV
Siltation III, V, VIII, XI, XIII

Ethnographic Interviews

I. Vera Arwood
Happy Camp, Davis Family of Ti Bar
Age 73, Former Karuk Council Member

[Memories of Previous Fish Runs and Water Quality] I can think back to 67 years ago and we had fish coming up the river just like that (gestures with hands) and no matter where you went you would see fish. And then every season you had the dead floating back down and you would see the lamprey go up and they would float back down. Now you don't see that. We used to get some of our fish at Ishi Pishi Falls but we had enough fish in the river that my dad had his own little dipping hole right below Ti Bar. We used to catch eels on the bar too, it was that plentiful. You used to be able to catch fish any time of the year. In the wintertime my dad had a different size net, the holes were a lot smaller. You could survive the winter. Families had their own gathering areas. Everybody knew where somebody's place was. We didn't go and pick in somebody else's place. That was kind of an honor thing. Now you can't get through the winter unless you get some kind of supplement. You could get anything to eat that was edible that the people used to eat. Now I don't think that no one has a right to tell us when we can do it when you have people who pay hundreds of dollars to come in, kill the venison and get the horns. I don't think that is fair because this is our livelihood.

We had nice deep holes in Ti Creek when I was young. The vegetation wasn't dried out and broken up the way it is today. Presideo Bar has changed. My gram used to have a big field that went down to the river and that got washed away by the flood of Sixtyfour. The river was never scummy the way it is now. You could walk around in the river, there was more sand than sediment. We had supplies from the river the year round. We hadn't been told that we couldn't get our fish any time of the year. That was put there for us by the Creator and when we were hungry we went to the river and got our fish. We never wasted it. What we got we ate. That's what I used to teach my kids when they were little and had BB guns. I said, 'What you kill, you eat.'

We used to eat Kaaf (Indian Rhubarb), and watercress. Now I'd be scared to eat watercress because you don't know where the water is coming from. And of course we had all the wild

turnips. There were lots of crayfish. Now you don't see them any more. We used to eat freshwater clams too. We used to get clams where we got our eels and fish in one little area there. There was more water in the creeks, now they are all drying up. I don't like people draining these streams for irrigation. I don't think people have a right to drain any stream or spring dry. There were fish in all of the big streams. Now there is no water in these creeks because of greediness. People taking all the water away from the river.

[Effects of Dams] [Water Fluctuations] When the water was down at Ishi Pishi Falls due to the dam release you had a hard time getting to where the fish were. They would turn the water down every three days or so and when it was down you couldn't fish if your fishing days were on that day. What day your fish day was, was when you had to fish. When the water was low the fish would go up the middle of the river and you couldn't reach them with your dip net. **[Water Quality]** And we could drink the water. I wouldn't drink it now. You had to drink it when you came off the ceremonies. When you came off the hill you had to wash yourself as good as you could and you had to drink the water. Before that you couldn't eat or drink water so I know it was traditional and no one ever got sick. The water always had a little color but it wasn't like it is now, soapy, with sediment, algae growing in it. Algae did not grow in the river then. It is just dirty now. It was real nice. It was smooth and it was deep, not like it is today.

[Klamath Project] That started when they started having less water. I think it dropped that way because of the dams and the farmers. The farmers were not born there. They were migrated there because they didn't have any thing else to give the veterans. Right now they don't give the veterans anything do they? They don't give them a place to go and live and say 'go ahead and fix your life there,' like they did with that war there [World War II]. So when they brought them in there of course they take all the water. Just like you have this place going up Indian Creek. Now there's no more Ice Creek because it is all going to irrigate someone's property. It's taking all the water to irrigate things. I believe you should have your place looking nice but to kill a stream completely, let it die off…I imagine there were fish in there.

I believe that the water is so warm now that the fish don't want to come up the river. I believe they want to stay right near the ocean where it's cool than to come way up here. They want to come but the water is so low it's warm. They run the water off to the farmers because they say they feed us so well, but I don't think they do. When the farmers were cut off from water they got subsidies. When the Indians were cut off from fish last year or the year before did they get subsidies? No. I think the government is being very lopsided by funding the water people and leaving the people who do not have any fish without any subsidy. We lost out because we didn't get our fish. My gram and my mom and my aunt would fix fish all during the fishing time. They would pile it in baskets and keep a huge smokehouse going all the time.

[Basketry Materials] I remember my old people saying basket materials weren't like they used to be. They were kind of scared to put them in their mouths. Scared if there was something on them. So they heated them up before they did anything with them. We would

get willow, grape and blackberry roots in the spring. You know there is poison in the river so how is a fish surviving?

II. Earl Aubrey
Happy Camp, Dillon Creek
Former Tribal Chairman, Traditional Fisherman, Age 63

[Memories of Previous Fish Runs and Water Quality] I was that little Indian boy running around on the rocks at Ishi Pishi Falls down there trying to learn how to fish. And I wanted to learn everything because I was so interested in the system. I would rather do that than drive a car. Yeah, I've seen a lot of changes in the river between now and that time. Back when they first put the dams in they didn't regulate the flows out of the dams. It pretty much stayed the same year round. As a little kid I would be down there in the summertime after I got back from Indian school around 1953 or '54. Probably earlier.

In the old days I could dip out 100 fish in two hours. Now it's been a long time since I've even seen anybody come close to catching 50 fish. We never did waste, taught not to waste. You got down and got what you wanted. I used to go down and fish for people. There were always people waiting for fish. It was always a challenge. I was young. It was always a challenge and just something I loved to do. You don't know what it feels like to stand on that rock and do that. I'm a hunter, but when I'm standing out there on that rock with a net in my hand it's hard to say I'm going to quit and go hunting. I gotta go down and get my fill of the fishing, then say 'okay, it's time to go hunting.' They both come at the same time and it's hard y'know. We used to catch our fish from our platforms in July. In May they used to start running thick at the mouth. Before they had that dam the salmon used to come three times further up river than they can now. Clear to the headwaters of the Williamson River, clear up to Washington State damn near. That sturdy fish, because that's the way the Great Spirit has it, to get to deposit his eggs and bread. You go that far and get cut off. He must suffer because he's got to drop his eggs so right there he must suffer. That ends his life because he's here no more. The spring salmon was the best eating, the best flavor of the fish we caught. It's so beautiful. That's when you eat a salmon [spring salmon].

[Water Flows] I remember that the water was high, extra high compared with what it is now because we had to build bridges. Every year we had to build bridges out to where we could catch the fish. There is no water now compared to what it was. Our winter days and our weather was different. Every year back then we always had three feet of snow or more down on the Aubrey place at Dillon Creek and that would stay for a month, two months sometimes. Our weather has changed. We ain't got the snow. We ain't got the rain. We ain't got the water. And with everybody taking water out of the water that's here, it even makes it less water than we should have.

What is I see is the water change. We just ain't got it. It's just not here. The springs that used to be here. The little creeks, the side lanes and all that's just all dried up. Even in the wintertime they're dried up. They will run water for a little time and dry up.

Everything here was affected by the ’55 flood. It was one way of Nature telling us that we had to change. We had to change our ways. It was devastating. Every creek, every river, everything on this river was affected. It straight guarded everything. It took the creek from being a creek to being a gutter. Now it’s nothing. It’s got no vegetation around it, just bare rock. The vegetation protects the water. Wherever there’s trees they do a great deal for the water because they give it the proper shade. They give it the proper habitat that it needs to keep flowing. Take that away from it-you got a little spring that comes out of the ground, it’s running, sure, it’s producing the same amount of water that it always did, but it hits the heat and the trees are all gone, the bushes are all gone. The sun sucks it all up.

The alders that came up after the ’55 flood suck the water all up. You don’t get nothing out of the alder except smoke wood. Nothing. It’s got no value but it’s just everywhere. It straightened it out. Covered up all the waterfalls and the riffles and the rapids and the fishing holes. It is like a concrete ditch with a stream running through it now. Fiftyfive was the last time the river got flushed out. Sixtyfour came along and had high water that raised up to the level that the ’55 flood was but there was no wash; there was no debris; there was no nothing so the river was just like a channel. It just smoothed out everything even more. Now there is just a straight flow of water going down the creek with no life. There are no more ponds and air holes for fish in the water. You gotta have them and you gotta have those riffles. I used to have four ponds in the creek down here. Now I got one little bitty pond that ain’t even a pond.

[Effects of Dam and Klamath Project] [Water Quality and Water Temperature] I think Iron Gate has a lot to do with the Klamath River because what it’s doing is during these slack years when there is less water, that algae builds up in the bottom of swimming ponds, well that’s the same thing that’s happening up there now and we’re getting this fertilizer and stuff from them farms building up on the floor of these little reservoirs. It is building up thick and then we get a little high water and they hold the water back. They hold the water back because they’re trying to keep their water level in the reservoirs which cuts it short from going into the ocean. Then it just builds up and finally we get our weather and they say, ‘Okay, we hit our level,’ and they turn it loose. Then they open the gates and all we get is that slush and cow shit and debris from them reservoirs and it’s pouring into our water and there is that white foamy stuff on the top of the water and this algae that is so thick you can’t even walk in it and it’s no good for the fish. It’s no good for the wildlife. It’s no good for nothing. And anymore even if we do have a high water it doesn’t flush it. It goes down the little channels where the water is supposed to be and all this algae is on the sides and it floats up and goes down to where the fish are and never goes away. There it is. That has a lot of effect on our river.

You dip in the falls and pull out your net all covered with this green stuff. It’s not right. It never was there before. It is all because of the reservoirs they have up there holding the water back, not letting it go. Then when they have to let it go and that crap is what washes out. If it was flowing freely we wouldn’t have the buildup no matter what they did to it up there. Most

of it would come down and drain out of there so when we got a high water, it would flush it clean. It doesn't flush out and eventually it's going to kill the river.

[Salmon and Steelhead] The runs take their time coming up the river now, especially if the weather is hot. Last year was a bad year. We had more fish than we've had in a long time, but by the time they got to the falls they were at the point they normally look when they hit the dam. They were that sad. They were black, they were faded out. They were fighting the heat of the water. They were going from creek to creek, staying where the water was cooler, but they were traveling. They were in sad shape. The meat was almost white when it should have been red. Plenty of the fish died. The water was just too warm for them. When the water gets to where it is now, it's like a stale pond. The water is not getting the flow it should have. It has to have the flow. When it gets this low it doesn't have the oxygen it needs for the things that live in it. The water has to be turned loose [from the dams] when the fish first start running. Give that fish a chance when he first leaves the ocean and comes up the river. He's gotta feel that everything's all right and he's going to make it. Let them fish know that nature's still the way it's supposed to be.

[Eel] There ain't no eels. There used to be a lot of eels. There were so many eels that when they started swimming back the whole river stunk. There were so many dead eels that you couldn't eat hogs or bear that had been eating them. We used to see dead fish like we saw dead eels. They made their spawning process in the river and they died off. Then they floated down the sides of the creek.

[Forest Management] The forest has to be managed like everything else. They've got to go in here and cut out the dead stuff so the young trees can grow, but not clear cut. They can do it. They got their equipment to do it. It's steep country and you can't go in there with a cat and log, but I'm a logger, it's like anything else, it's what I had to do to make money and I seen what they were doing wrong a long time ago. I didn't like it. I cut right-of-ways to every one of these dam roads. I watched them go right through deer migrating grounds, deliberately, knowing that the deer migrate through a spot and they didn't have to do that.

III. Laverne Glaze
Orleans
Basket Maker, Age 73

[Eel] I remember when I was 10 years old going eeling, there was a platform down at Boise Creek, all the eels that came out of that, I just couldn't believe it. And now we can hardly get an eel. And that was 60 years ago. There was eels…you could have any amount of eels you wanted. There was a lot then and they are almost nonexistent. The boys would be swimming and they would spread out and let the [dead] eels go by and jump in again. There were so many eels that they would float coming back down.

[Steelhead & Salmon] I remember because the elders gathered in July and that's when fishing season started. In the Sixties we used to begin catching fish in July through November, and now it's later.

[Siltation] Now doesn't that silt close the river down at the mouth every so often. Because I was down there one time and the whole beach was closed off, it was like a mountain.

[Water Quality and Water Temperature] For one thing fish are not going to come up that warm water. So it's warm and it stays warm so it gets later and later in the year before the river cools up enough for them to come up. I've been fishing all my life and by July we were out there fishing and catching fish, nice fish. And catching our limits which was ten then, and now you can go down there and cast all day probably…The steelhead aren't going to start moving around until the water gets to a certain temperature.

[Controlled Burns and Basketry Materials] Well the effects I've seen on basketry materials in the last 35 years is the deterioration of our materials. They're buggy. The water doesn't come up enough to push out all the old willows and bring new growth back so here we have this big old stob of a willow that pushes out shoots that are all buggy because they've gotten too old.

We've had to start using ceonothus because we can't manage our hazel patches.
I've been fighting for hazel for a long time. We've got hazel patches; they've got to be burned. Torch her off…

IV. Norman Goodwin
Katamin
Ceremonial Leader, Traditional Fisherman, Age 74

[Historical Changes] [Water Level Fluctuation] When I was young, the water flow would begin rising about two o'clock in the afternoon. This was due to the Copco Dams operating on a schedule of 12 hours on and 12 hours off. In this situation, Iron Gate helped the fish due to evening out the flow, this helped out the spawning. **[Stranding]** With uneven water flows gravel bars would be exposed which trapped and killed young fish. Even so, I don't think the dams are needed. **[Effects of Dams and Klamath Project]** If Iron Gate and the Copco Dams were removed the salmon would be able to spawn again in the upper Klamath. The salmon used to get through the upper Klamath Lake and spawn in the Williamson River on the Klamath Reservation. If all dams were removed, salmon would go on up the tributaries that fed the lake. Iron Gate also had rearing ponds at the dam and there were spawning areas below as well.

There is enough water to be divided between the fish and the farmers. The problem is land development. More water is needed by the farmers to keep up with the level of development. At the current rate of development there will not be enough water for the salmon. The tribes need to work with the farmers. If water continues to be pumped out of Klamath Lake, the supply will be exhausted. An alternative would be to sink wells as there is a lot of ground water.

Most of the water in the Klamath comes from the Shasta River, Beaver Creek, the Marble Mountains, the Trinity Alps, all of which contribute water to the Klamath River.

The Karuk used to fish with spears on creeks, but now the runs are down to a level where this is not feasible as spear fishing requires a lot of fish. Dams have an effect on the salmon, as barriers. I don't think Iron Gate has an effect on downriver salmon as water is let out for salmon. Farmers are a greater source of problems for the fish than are dams since farmers have begun taking greater amounts of water. A study needs to be made of how much water the salmon actually need.

[Dam Removal] It would help the runs to remove the dams and open up the original spawning areas on the Klamath Reservation. Gill netting should be stopped. Traditionally fish were caught with set nets and weirs, not gill nets. There was a weir at Orleans. Yutamin means lower dam, min means dam, Yutamin and Katamin were named for dam (weir) sites. Fishermen would block the weir then dip salmon which were nosing up against the weir. When enough fish had been taken in a day the weir would be opened to allow fish to go up stream to spawn.

Hard development of land in the upper Klamath Basin began around 1940. Going back to 1945 or 1950 there was enough water. Development since then should be based on wells as a way of dividing up the water supply. This is a political issue.

[Salmon] Aboriginally there were three species of salmon –the Coho (dog) (choon); Chinook (aama) and the King (poeet). Chinook had both summer and spring runs. There was a late summer run of Coho, a late summer run of King, and summer and spring runs of Chinook.

[Traditional Fishing Rules] There used to be fish days, only so many fish came up this run, not enough to feed all the communities up to Happy Camp. Therefore Indians speared fish, and had set nets and dip nets at Ikes and Katamin. Now it is different. There is turmoil and it is going to get worse since people are fishing at Katamin for elders all over the place. This can't work. There were fishing days and there were enough owners so a fish day came up every third day under a family's ownership. There were three fishing spots – two on this side and one across the river. So there were three families fishing every day with a total of nine families owning fishing days. Nine owners were a result of determining that that was all that could be taken out of the river without affecting the stock of fish. If you owned a fish day you could take what you needed and then distribute to others whatever was left over.

That worked for centuries. Now people come over and fish for elders with people dipping who don't have a fish day. There will be trouble…There were salmon even in low water. I remember my grandmother talking of low, warm water and dying salmon. That happens-weaker or diseased salmon die and the strong survive.

[Water Levels] Some of the older spawning areas have been affected due to low water due to dams. This has no effect on making medicine. There have been low water days down through the centuries.

]Effect of Dams and Klamath Project] I noticed a decline in salmon in the mid 1960's at a time of land development requiring more water. They need to stop developing land and drill wells for water. A standard should date from the mid 1950's. Iron Gate helped the salmon due to evening out the flow.

V. Grant Hillman
Dance Owning Family, Orleans Age 74

[Water Policy] Water or Fish –(chuckles) You know, I'm sure that they know what they are creating. I'm sure that if they could put the fish into extinction, what need would we have for the water then, see? And I'm sure that their long-range goal is to do away with the fish. Then they could have all the water down south. They will say, "Well you don't have no more need; there ain't no more fish." This is the way…They can't be that dumb. They're smart; once they get their foot in the door…you can't get it out. It's just like, here in the winter, the outfit that wanted to barge water out of the Mad River, same thing. Once that water district starts selling them water and they're floating it down to San Diego in this great big balloon… You can't stop them once they get their foot in the door. And they just keep forcing the door a little more open all the time. Once they could do away with the fish, 'you guy's could fish the lakes. We'll stock them for you.'

[Effect of Iron Gate and Other Dams] I'm sure they have had effects. Anytime that these dams…I've noticed as a kid swimming down here, how the **[Water Level Fluctuation]** water fluctuated every afternoon. The river, you could go down there swimming like at noontime, the water's going down. Then around 4:30 or 5 o'clock, here comes the river back up – from the dam. Every single day. You could set your clock by it. And I'm down there swimming every day and this water is going up and down every day. That was during the depression years, like '35, '34 or '35. **[Stranding]** If you're raising this water every day then dropping it, you could go along the shore when you're swimming and you see schools of these little bitty fish, thousands of them all along the river banks. When this river raises every day, then drops these fish are caught because they are right along the shore where they are safe. These were baby salmon and steelhead. There was everything. I don't believe it really affected the eels because I've seen eels like in the sand, sandbars, y'know where the sand is wet. They would be in there. But these little fellows…they did it every day.

There ain't no natural fluctuation. The only natural fluctuation was in a big thunderstorm when there was a big runoff. There's nothing else making that fluctuate except the dams. And to me, these little bitty fish, say this is the shore right here, they're not six inches out here and when as that river raised they followed right in. Every day you're loosing fish. They never ever have a chance. And I'm sure it's the same thing now, up and down, up and down.

[Siltation] I think the dams have caused a lot of silt where you don't have the natural flows to take the silt out. You got silt coming in, and most of our silt anymore, y'see what road building and logging has done…I don't know what they consider wetlands, but I built road up

here in the Mill Creek gap, the other side there. And you would be surprised at the wetlands that are in the mountains. The Mill Creek gap, the other side there. And you would be surprised at the wetlands that are in the mountains. You can walk through a prairie, it's wet y'know, and you have these mountain beaver and you can look down in these holes, about two feet down, and there's water running.

[Roads] When you go to building roads, you got to siphon all that water and divert it, because you can't have all that water running under your roads. So I've diverted it, oh say, maybe a hundred yards. And you'd divert this water to a runoff location where you want to put it. This makes a stream, a creek. What does it do for these wetlands… **[Natural Processes] [Wetlands]** This is Mother Nature's way. Anybody gonna divert water [without negative consequences] it's gonna be these mountain beaver that divert it. That's nature's way. But when man goes in there, with a back hoe or a 225 [tractor] above where you are going to build, and cut a big trench to divert all this wetland into a draw, then you are causing, in the wintertime you're causing all this silt to go into the river. Well you got a dam up here that the river can't flush itself. The river has to flush. This is what they were doing a month ago on the Trinity. Trying to flush it. So they are warning people to stay out of the river because they're flushing it. But are they flushing it at the right time? Like you take, right now is the right time to be flushing the river. The reason I say this is because the right time is when it turns hot in the spring, you get all this snowmelt, the river raises and it is flushing all this winter silt. This nature's way… So when they start flushing the river before the snow melts, after the snow melts, then they are not doing it at the right time. Nature's way is when the snow melts, it turns hot, all your rivers start raising, flushing out what came down that winter.

Because our fish come up, we have the spring run, and if you flush it at the wrong time, you're flushing all thee little fellows on out when they're not ready to go. That's my way of thinking. And everything man does, he tries to turn nature's way around to suit himself, then it screws everything up…If you can't follow nature's way in what you're doing, it ain't gonna work. Because our fish are in a pattern, they are always gonna be in a pattern and you can't change that. I think you see every spring…I've always watched, some years you're gonna get a bigger flush because there's a bigger snow pack. But like this year, the river's up now. Our snow pack is going fast. As a general year we don't get this. We get it in June. June is when it really starts getting hot, nice warm up. This spring is a little screwed up. But I'm sure that all species knew this was coming. They're way smarter than we are, otherwise they would not be here today. What our weathermen don't know, these fish and animals know. They are way ahead.

[Siltation]…has a lot to do with our rivers silting. When we get fires now they are so devastating so the run off is not natural. Generally we'll have…years ago we had a lot more lightning here. Before Shasta Dam, before the big lakes were created over there we had a lot more electrical storms here. And these electrical storms cause a lot of little fires. Y0u don't get this sort of runoff and silt that we do in a devastating fire now. But it seems to have shifted once they put in the Shasta Dam and other dams. Huge bodies of water changed our weather pattern. So like the Salmon River country, it is so devastated with fire is because it

shifted. We don't get lightning here like we used to. Whenever you put in big bodies of water it changes weather someplace in that location. It changed the rivers, the runoff, the silt, everything that went into the river.

I think when they're doing this kind of stuff…I don't know if they really realize that big bodies of water change weather patterns. It is all about money. It's not about nature. I don't think that there's enough public input on anything that they do. Just like the Forest Service has meetings for timber sales. You read about them in papers and only one person goes. So your people have either put their whole trust into the Forest Service to do whatever they want, either that or they have lost concern. Why do it? You ain't gonna change it. I think this is what has happened. I've been to some of their meetings and you might as well bump your head against a wall…whenever anybody has a question, they bring up the guy who has the answer. They are just shutting down their public meeting.

[Iron Gate relicensing] [Klamath Project] I really don't know that country that well, but the way I understand is that it was high desert country before they put the dam in, with a huge marsh. So to me we have to think…and these potato farmers are subsidized by the government. I get potatoes out there for nothing. You go out there and pick them up. Otherwise they are plowed back into the ground. So the taxpayers are paying these farmers to farm. They are being subsidized by the government; plow them back into the ground. Then our fish are…the water is being taken. The government is subsidizing somebody who can't even sell what they are planting and you are killing fish over this. To me it's idiotic. You can't tell me there isn't good farm country that you don't have to put a dam in and take the chance of running something into extinction for something that you can't sell. I don't think it should be relicensed.

That's like one on the Eel River with PG&E diverting it and running it into the Russian River, that's worse yet. I think they can say all they want, 'well it's a flood deal,' the sucker's full right now. This is where a lot of our high water is – They are letting it out before its time to flush the river. Otherwise the snowmelt would be flushing the river instead of those guys flushing it at the wrong time.

[Natural Processes] To me, about the only dams that we had along the river way up was beaver dams that have water back for a reason and we have beaver all along the river. They are still trying to do nature's work. But as far as these farms that take water at the expense of fish, it's not right. I don't think. That's my way of thinking. The miners to begin with screwed up the fish enough and now we got the farmers so between …and if it ain't the farmers maybe it's gonna be somebody else. They are continually after a natural resource here and this is <u>our</u> river.

[Changes Which Would Benefit the Fish] [Salmon and Steelhead] (chuckles) [That would be] changes that they wouldn't want to hear you know. The Salmon River has always been good because there ain't no diversions and dams and stuff up there. So these people are looking at these other little rivers and creeks as being able to sustain the river and it won't. They say well, look at the Salmon River, got all kind of salmon in there. Get up the Salmon

River and they do fine. But it's a steep river and it's running fast, so it is colder. But this is not …when that Salmon runs into the Klamath it slows down so that water is gonna get hotter until it kills the fish. As a general rule man hasn't interfered too much on the Salmon, so it's just like Wooly Creek, good spawning, steep.

[Fish Kills] And this is the whole thing and they say how come the fish all died down there. Pretty simple, when it hits that coastal plain that water is just barely moving. I don't care how deep it is, it's just barely moving. And that's where these fish have to stay down there until things is right for them to come up. Like when they hit the mouth [of the Klamath River] they go in and out, in and out until they get climated in and they stay in that coastal plain until everything is perfect for them to run. I don't believe before this dam that they would have been caught down there like that. I believe that they would have come right up the river like they was supposed to. They wouldn't have been congregated down there where it got hot and killed them.

[Effects of Iron Gate Dam on Ceremonies] Everything about out ceremonies here on the river is about fish. Ninety percent of it has to do with fish. Bringing the fish up at the right time and with the dam up there you can't bring them up at the right time. And you can't change fish. They have been coming up this river since time began. So they ain't gonna change; they will die first. If they could change they would, but man has regulated it to where they can't come, they are not ready so they just got to die down there. And putting the Trinity River water in there to make it cooler is not the answer. It has to be from here.

[Cultural Continuity Between Tribes on the River Corridor] [There was] continuity between the culture of the Yurok and coming up here to the First Salmon Ceremonies and communication between the tribes to assure that the fish would be healthy.

We was also hunters, but not on the river, hunted high country. Your game is best in high country. These river, what you call 'poison oakers,' you can't compare them with high country game. To me your fish is the same way. Everybody goes down to the [mouth of the] Klamath to get good fish. There was good fish here at one time, but now they can't come when they … and get here and still be good healthy fish because of the water. Fish and game to me have got the people completely brain washed into thinking that when salmon spawn they are dead, they die.

This is not so. Look at all these short rivers – Smith River, Mad River before it was dammed. The Smith River is a perfect river because there is no dams on it. So you still have steelhead like the one I'm holding over there (indicates a photograph) that's about a 16 pounder and you got 40 and 50 pound salmon regular. Mad River was the same way, Eel River used to be the same way. Okay, you go down the Klamath to Blue Creek, the first good spawning creek on the Klamath. All the big salmon are there. They are close enough to the mouth to make it back to the ocean. Once they hit that salt water they heal up and they come back as 40 and 50 pounders the next time. We used to get 40 and 50 pounders up here at Ishi Pishi. If they can make it to salt water…if you got a good current and a lot of water, when they spawn they'll make it. If they can make it to salt water they'll live. How come all these short rivers has got

huge, huge fish? They make it back [to the ocean] and come back. I've seen them there in the mouth of the Mad River make it down to the mouth of Mad River when I was a young fellow. They'd come down that Mad River just half dead and you go down to the mouth and you watch them go in and out. Pretty soon they're gone. But to me being like they've regulated our water to where the fish can't make it back our fish haven't got a chance. The water's too warm. That's traditional knowledge.

I would be willing to bet if they don't have hatcheries, they have the technology to take seawater, keep it aerated and take them back [to the ocean.] Wouldn't need a hatchery no place. These fish would come back. There's nothing unusual about big salmon in Blue Creek, exact same salmon, but they are close to the mouth. They don't have to die. There are natural flows in this river so they can get back. Especially on like your spring runs.

VI. Leaf Hillman
Vice Chairman, Karuk Tribe of California
Dance Owning Family, Orleans Age 42

[Impact of Iron Gate Dam on River and Tribe] [Salmon and Steelhead] I guess in talking about the impact on the river and the Tribe from the dam, I would talk about fish first. First because, anything I would talk about has to do with**],** including the fish. One of the first things you would have to talk about is [the loss of species] and how that changes the composition of the runs, what species runs when, has affected culture and tradition. In Karuk country, our fishery is now limited to a fall fishery. That fall fishery begins any time now, usually from mid to late August through September and a little bit into October. In October, depending on the year, if there is a fishery still going on in the later parts of October and into the early parts of November, that's when our [Coho] run, if there's a decent run of Coho, then our fishery might still be active except for the fact that we have a conservation plan and we voluntarily do not harvest Coho.

So we're taking almost entirely Chinook and there might be a little overlap toward the end of the fall run of Chinook where you have some intermixing with Coho for awhile and you might have some incidental take of Coho. So that is pretty much it, a month and a half, maybe two months maximum, all fall fishery.

[Fishery Politics and Sovereignty] In our case you could blame the regulatory agencies and the fact that the federal government doesn't acknowledge our right to fish and so the fishery has been confined to one place, but that doesn't explain it. Just look at the Ishi Pishi Falls fishery and the fishery that once was there. What is there now? If there is any place that you want to gauge effect of dams, it's a place like Ishi Pishi Falls. Why? Well you can go downriver in Yurok country and they fish with gill nets now, wasn't always the case. They also had platform fisheries, but they have adapted to a gill net fishery exclusively. And over they years they've had their fisheries affected by state regulations saying you can't fish with gill nets so they would have to do it at night. So there's no continuity there, not only in the fishing method or in the actual practice of the fishery because it has been altered unnaturally by outside regulation, interference and the change in fishing techniques.

And then you take a place like Ishi Pishi Falls. I would argue that outside influence in terms of state or federal regulations, or attempts to regulate or control that fishery have had little or no effect. I would argue that strenuously. The nothing about the methodology of the dip net fishery at Ishi Pishi has been altered. The only thing you can say has been altered about it is we don't use Iris fiber to build our nets anymore. Nets are built out of cotton string. Other than that the gear is the same. The practice hasn't evolved. It was the most evolved practice that there was, in that spot on the river. So the methodology hasn't changed and it hasn't been affected by federal or state agencies.

When you ask people what that fishery used to be like, it wasn't that people would be showing up looking for fish around the middle of August and plan on being done typically by the end of September. So what has affected it is the availability of resources. If fish are there, fishermen will be there. That was a year round fishery. The one exception is in extreme high water, then you have high water fisheries that would kick in. There were fish there year round.

And it's like for the Yurok too. All they talk about is the fall fishery. We go to meetings and we argue about how many fish we're gonna get this year and how many fish are those guys gonna get. Well, they're not talking about fish; they're talking about fall Chinook salmon. End of list. They don't count, they don't bother to count; they don't fight or argue over any of the other species. Why? Not an issue, because they're not there.

The spring fishery in Karuk country was the staple. That was the bread and butter. That was the biggest run of fish. Same for the Yuroks, same for the Hupa. That's when they put up their fish. All of the tribes have transitioned to the fall fishery because it's the only one there. There's a few spring fish left but it's not worth counting. It's certainly nothing you can depend on.

[Effects of Iron Gate Dam] In the case of Iron Gate Dam on the Klamath, and the dams above it, these were the initial blow to spring runs on the Klamath but Iron Gate Dam put the nails in the coffin of a species that was being slowly done away with. Iron Gate Dam accelerated that to the point where, when Iron Gate Dam was first built there was a mitigation hatchery built that was to mitigate for the species that were going to be lost. The number was calculated on how many miles above were lost. So part of their mitigation was a certain number of spring Chinook. The hatchery still functions, still operates and the original mitigation of the number of species they were supposed to produce…So what are they doing today? They meet or exceed their quotas for Chinook and steelhead. What about the spring Chinook and the Coho? Well those were mitigation measures. How come you're not doing them? I'll tell you why they're not doing them. Because those fish don't exist there any more. But they existed when that dam was built, otherwise there would not have been mitigation measures applied to them. And they did for the first couple of years after the dam was built. They caught Chinook and Coho salmon there. They took eggs from them, reared them and released those numbers because they were required to under the mitigation measures. Within ten years after that dam was built they had neither of those species showing up. There wasn't

enough viable return to get enough eggs to produce the progeny that they were required to produce as mitigation measures.

I don't blame Iron Gate exclusively for that. Iron Gate was the one that put the nails in the coffin. It finished them. All you have left is surviving remnants of both species-the spring Chinook and the Coho salmon in their habitat downstream of Iron Gate Dam. This is places like Wooly Creek, the Salmon River, Indian Creek, Dillon Creek, Clear Creek, Elk Creek. The bulk of those early runs were produced in the Scott and Shasta Rivers and the places that lie above Iron Gate Dam. Those were the high production areas for the bulk of those runs. Those little tributaries here and there that have remnant populations now, That isn't where those 10,000,000 fish a year were coming from. The small tributaries couldn't support those runs. They came from the production grounds, which were above Iron Gate. Those species don't come back to the dam anymore. There's a direct correlation between the species composition that you see now and the dams. People say, "Well, the logging impacts…" Well there were impacts from logging; there's no question about it. Mining had impacts. All those things are true, but when it comes right down to what's making or breaking those species, it's the dams. It's the dams. It's the dams. It's the dam. And there is no question about it.

Many of these little streams have been impacted by road building or mining, logging, all those things and have lowered their production, but there's still production there. Those fish haven't been eliminated. Look at the lower river that has been raped and piliged by Simpson Timber Company. They have eliminated entire populations from small tributaries, which had never been large producers. They've never born the burden of production. They couldn't, they never could have. The production that occurs in the Klamath Basin is in major tributary streams. The first is Blue Creek. It still produces spring Chinook, fall Chinook, Coho salmon, summer steelhead. The same is true of the Trinity River. Then you move up this way. Bluff Creek and a few other smaller streams. The Salmon, Scott and Shasta Rivers…What about the Sprague and Williamson Rivers? How many hundreds and hundreds of miles up there is that? What kind of production was lost out of those systems? So no doubt there's enough blame to go around for everybody.

The dams are stand alone as the ones responsible for the continued demise of all the fish species. **[Eel]** Who could we blame for the demise of the eel population, the lampreys? We got no ocean fisheries out there catching them. White people don't catch them because they don't like them. Who is catching all these eels? Where are they going to? It used to be you could go down and fill a 55-gallon drum with them in half a night. Now you can spend a week down there at the height of the run, if you could figure out when that is. Which chances is you couldn't because there really is no peak in the run anymore. You're lucky if you can detect when the run is anymore, let alone when the peak is. So what's responsible for their demise?

Well for a lot of years people thought that maybe the same thing that was depressing the salmon and steelhead runs. **[Roads]** Maybe it's the sedimentation from logging or road building. Then there was a popular rumor. Maybe it's the farmers who are poisoning them; or maybe it's the State Fish and Game, or the power company that gets the eels caught in their

turbines and they are poisoning them. Or the farmers whose head gates they get caught in so the farmers are poisoning them. And while I would have no problem believing those stories about people intentionally poisoning them I don't think you explain the decline of the Lamprey that way. It was not just a gradual decline. It was gradual for many years and then became precipitous for the last 15 years. And some of those other factors may explain some of the decline but when it comes down to explaining the precipitous decline there's no doubt in my mind what explains that. It is the dams and the operations of those dams.

Well people say there have been dams on the Klamath for many years and we still had lamprey then. Well we still had a lot of things then. The operations of those dams, just like the operations of the Klamath Project itself has changed dramatically since the 1970's. So when people say the dams have been in there all this time; how could you explain the fact that the dams were there all this time and all of a sudden these species go off the deep end? Well, if you look at the operations of the dams; if you look at the operations of the Klamath Project that coincide with the change in operations practices of the dams you'll find at that point in time the species fell off the edge. The change in management was a series of things. **[Klamath Project]** It started in the upper basin with the Klamath Project itself operated by the Bureau of Reclamation (BOR). They had something like 80,000 acres in production. Back in the 1970s they decided they needed to reach their target, which had been 250,000 acres. The Project had grown since the early years to a point in the late '60's that the lakes were diced and dried up. You dry them up and use the land to farm. You make the lakes smaller and then you take that water out of the lake to irrigate the parts that you dried up. And these lakes are surrounded by high desert. The lakes happen to exist in a high desert environment. So you do away with Lower Klamath Lake altogether and you reduce Upper Klamath Lake by three quarters. You do that mechanically and then you draw water from those to feed this barren land. And in the process of doing that you're eliminated all of your marshlands. There are no marshlands; there no edge waters any longer because all of those are dried up. And so you now have a little bitty lake that has no marshlands. The extensive marshlands that once existed in the Upper and Lower Klamath Basins were huge. The lakes were huge but the marshlands were bigger than the lakes. The marshlands extended for miles. You read in the journals of the first white guys who went through there about how Godforsaken this country was. They ran into Indians there and couldn't figure why they were. Why would anybody want to be there? Everywhere they went there was mosquitoes and marsh. They couldn't find dry land to ride their horses on. They couldn't find places to camp. They traveled for miles, no place to camp that wasn't a marsh. That is indicitative of the change in the ecosystem that started this whole chain of events that's taken place since then.

So then in the Seventies they change operations in the upper basin and they all of a sudden go from 80,000 acres under production to their 250,000 acres. A pretty dramatic jump when it took them from the early 1900's to 1960 to get to the 80,000-acre level. Then from the late Sixties to the early Seventies they went from 80,000 acres to 250,000 acres under irrigation. So all of a sudden an ecosystem that has been dramatically altered already, but slowly over time, is changed drastically. The long period of gradual change explains why through the Sixties and clear up into the early Seventies the Klamath Tribe, even though these projects and the dams had effectively eliminated the species of anadromous fish that they once relied

on. **[Sucker Fish]** But in the early Seventies the Klamath Tribe was still harvesting suckers in Upper Klamath Lake by the tons. They were catching hundreds of thousands just like they always have, and probably more so because of the loss of anadromous species. Their reliance switched from anadromous fish to sucker fish from the time of the first dams to the Sixties and you have an increased intensity of reliance on the sucker species with apparently no effect clear up into the late Sixties.

Coinciding with the decline of the anadromous fish in the Upper Basin, which increased the fishing pressure by the tribes in the Early Basin, it also had pressure from non-Indians, not that non-Indians wanted to eat the sucker fish, but the non-Indians harvested them by the ton as well up there to use them as fertilizer. They harvested them intensively throughout that period of time and they were still harvesting them for fertilizer back in the Sixties. These are not little fish, they get big as a salmon but they are very prolific, capable of quick recovery. But then in the early Seventies there was a huge acceleration by the Bureau of Reclamation to get acres under irrigation. They accomplished this in about four or five years and arrived at their target, which was 250,000 acres, and they arrived at that level of acreage under irrigation by about 1976. That occurred over a five or six year period of time. This wasn't something that occurred over 60, 70 or 80 years. This happened in five or six years. Low and behold, what coincided with that in the Upper Basin was the rapid decline of the suckers. By 1980 the Klamath Tribe decided to stop fishing because of the decline in the suckers. They hoped that by not fishing they would reduce the pressure on the sucker population and they got laws passed to keep non-Indians from harvesting them for fertilizer. Since 1980those fish have been entirely protected from fishing pressure. The Klamath Tribe now harvests two fish per year for ceremonial purposes with the hope of recovering this species. A species that is certainly capable of recovering quickly. The thought was eliminate the fishing pressures and they'll recover. Well they haven't recovered as a matter of fact they went the other way and are hanging on by a thread.

People can say, "Well, it's just a sucker fish." Yeah it's a suckerfish but it's a suckerfish that those people relied on exclusively since the elimination of the anadromous species from their territory. There is no coincidence there. The decline and the collapse of the sucker population in the Upper Basin is the localized expression of what is happening to the Klamath River. The downriver expression involves the decrease in water quality because of all of that water now going to irrigate a quarter of a million acres. So there is less water going down the river and more that is going down is polluted because it has already gone through the fields and gotten pesticides and there s no natural filtration system anymore because there are no more marshes. Then they dump it back in the river.

The Klamath now has a whole system of dams and reservoirs that are not large compared to others but with this series of dams less water is coming into them so the water has to be held longer in order to maintain the size of the reservoir. And once they are at full pool their recharge capacity is less than it once was when less water was being taken from the system. **[Water Quality and Water Temperature] [Water Level Fluctuation]** Now you have stagnant water sitting there warming up with added nitrates and the algae is blooming and it is evaporating too. So by the time you get to Iron Gate Dam the water is really crappy and

warm and not very much of it coming out. That has put a crimp in the power production because they don't have enough water. So they change their practices. They don't generate power by that water just sitting there; they generate it by spilling water. So they raised the levels of full pool on each of those reservoirs to capture as much water behind them as they possibly could so they began to push the limits of how much water they could hold. And then they would spill. Spill and generate electricity. When the top one spilled to generate electricity then the next one down would have to do the same thing. Then once they had drawn down the pool they couldn't generate any more power so they would shut it off to allow the reservoir to recover but the recovery time has been slowed dramatically by the developments in the upper basin. That was the reason for building Iron Gate Dam. Because filling them to capacity and spilling all of it was the only way they could generate enough power to make it worthwhile. This resulted in ramping and fishermen drowning. In two hours time you would have a raise in the river of 13 feet. And then boom, back down.

So Iron Gate Dam was built to regulate those wild fluctuations in flows and Iron Gate was supposed to be nothing but a regulating dam to even out the fluctuations and spill at a steady rate. That was a great idea right up to the time they put a turbine on the dam and started generating power there. Although it is a small turbine, putting it on Iron Gate Dam was just insanity because now you need to build another one below that and now you have to figure what to do to deal with that fluctuation. But because it is a dam intended to normalize the flows they built a small generator and turbine there so it doesn't spill that much and it doesn't cause these wild fluctuations and it produces a little piddly amount of electricity. But none of these dams produce much power. The new thermo generation plant in Klamath Falls produces more energy than all of the dams on the Klamath put together.

The effect of the dams on the suckers, their precipitous decline, is the same effect that we've seen down here on a lot of species. And the timing of this decline coincides quite nicely with it as well. I don't deny that from time to time people probably tried to poison lamprey, but I don't think that explains their precipitous decline. What explains their precipitous decline is those dams and the operation of those dams. **[Natural Processes]** And while Iron Gate has served to regulate these wild flows, they've served to regulate the natural…they don't mimic the natural system any longer. It regulates it out – summertime and wintertime it regulates it but it doesn't regulate it to mimic nature. It doesn't regulate it to mimic our spring freshets; that role is lost.

The regulation doesn't serve the purpose served by our big flushing flows of the wintertime; it minimizes those and because of the effects on the stream channel that this has caused over the years, it's shallowed and broadened the river. People say, "Well, we still get high water. In 1997 we had a big high water…" Right, and I understand that the dam doesn't have the ability to regulate that out of the picture, there's no way in hell it can, but it has served to regulate and change the river morphology to where the river is shallower and wider so when you do get this big flushing flow in the winter that they can't control the effects of it are actually worse than floods we have in the past. Floods will always go on, but the impacts that they have…For how many thousands of years,…you have a place like Katamin sitting there. You might say the place is unstable; that it is unstable around here. Not that slides never

happened, I'm saying how many thousands of years of occupancy of these villages can we prove scientifically, about 4,000, if we'd let them dig a hole. And out of that 4,000 years there's probably been a few floods. And when did all of a sudden about half of Katamin disappear and go down the river? What flood did that? The '55 flood took a chunk, '64 took a huge chunk and even little high waters now threaten to take more. All the floods in the past 4,000 years didn't have that effect on it. **[River Morphology]** The effect has only come about only since those dams have been in operation changing the river morphology, changing the characteristics of the river.

[Floods] In the 1700's floods that had water in much higher elevations than these recent floods did not have that effect. When the water receded the river went back to its channel. So you didn't have these catastrophic effects. Now if you have a flood, hell, the effects are catastrophic because of the way the river has been altered so dramatically that… **[Effect of Iron Gate Dam on Cultural Resources]** I can hear people like PacifiCorp saying, "What do you mean, 'effects on cultural resources? What do you mean, "effects on cultural sites?' Well what I mean is the village site at Akins Creek. What I mean is the village site at Red Cap Creek, Katamin, Amikiarum. "Well, wha, wha, what effects do we have on that? How can we possibly have an effect on those sites by what we do way up here? It's like that is just natural erosion taking place and the result of floods. We can't control floods. Floods happen." I've heard all those arguments. This is a failure to recognize or failure to acknowledge and certainly a failure to accept responsibility for the role that they have played in altering the river channels and the river is going to react in a very different way. All the village sites I just named have had catastrophic effects from floods, but only since the Sixties. Prior to that '55 got it started, but you've had dams altering this river since before the Fifties. None of those things are coincidences so directly the dams have caused a tremendous impact, but indirectly they've caused a greater than tremendous impact.

The long-term indirect effects are much greater than the direct effects. The direct effects of loosing hundreds of miles of anadromous habitat – yeah, that's a big impact; the fish no longer can go there. But as far as the real impacts, those come from changing the characteristics of the river and the river channel. The species that are now in collapse and freefall are a consequence of that, species that are dependent on a natural system being and acting natural that no longer acts natural, is no longer allowed to act natural and when you do have a "natural event" the effects of it are no longer natural. These big natural events now cause very unnatural catastrophic harm, even to the fisheries. **[Eel]** The lamprey…they spawn in the tail waters. They want to spawn right along the riverbank and there's a couple of big runs that come every year, one in the dead of winter. You have a run coming in February and these are runs that you have now, not runs that we used to have. There used to be a lot more lamprey runs than we have now. Now we have two identifiable runs. The unnatural conditions that exist in the river and the way that they unnaturally regulate the flows…"Yeah, we're going to go ahead and have a ramping schedule. And they say they are trying to mimic nature and they try to mimic nature… right up until the irrigation season starts. Then they regulate it down to nothing. The effect that has had has been to strand and dry up completely areas where lamprey spawn. The freefall collapse of the lamprey has been precipitous and obvious and coincides with Iron Gate Dam and the regulation of flows.

[Effects of Iron Gate Dam] So as far as the effects on people goes, we don't have a spring fishery at Ishi Pishi Falls anymore. I keep going back to Ishi Pishi Falls as the one constant where, like I said, state and federal regulations haven't altered it. Really the only thing that altered that fishery is the availability of fish and so if fish aren't there, people are not going to fish so now people don't fish there year round like they once did. You had people fishing from the early spring throughout the summer months. There was always a run of fish that was there and was harvestable except for short windows when you had very, very high flows. I assign the blame for that impact to the dams. This is what is impacting these fish that basically don't exist anymore. The impact on people is pretty obvious.

How many Karuk families still live at Katamin, or any place else that sustain themselves on fisheries? Whenever you remove people from a place there is an effect on the culture. It's pretty hard to maintain cultural continuity. The impact on culture is that it touches every aspect of life, of traditional cultural values and ways of life down to your religion. Everything is touched. Then you can move into basketry, basket materials and the impacts that the change in the river has had on the availability of resources. There is no part of our culture that is not adversely touched clear down to religion and the practice of religion. The practice of ceremonial, ritualistic practices like the boat dance. Where are we going to do a boat dance because we can't do it any longer at the original site because the river channel has been so drastically altered that it is impossible to do it there any longer. Probably no mitigation short of removing the dams will make a difference. I say that based on experience and practicality.

[Klamath Project] [Mitigations] If the Klamath Project were taken back from its present 250,000 acres to around 50,000 acres this would make possible the restoration of significant marshlands in the upper basin. Scaling back the project to 50,000 acres, reexpanding the lakes, basically reclaiming what the Project claimed, doing major lake reclamation. Taking what was formerly lake and now is under irrigation and making it lake again. The result of that is going to be more water, better quality water coming into the river system because the river system did not entirely fall apart with those dams in place. It's been how those dams have been managed with a reduced amount of water and reduced quality of water. So if you were able to do that as mitigation, taking 175,000 acres out of production and put the water that goes with that into lakes will result in cleaner and more water going into the system. First of all that will restore the sucker population. But you are still going to have these dams.

What is the purpose of these dams? Are they for power generation? Do you want to save the dams for this little bit of power generation or do you just want to save the dams for nostalgia? Let's put fish ladders around there. Upstream, downstream passage for anadromous species. That's a mitigation. Those are the things I think about when I think about mitigation. The other mitigations that would have to go along with that are the operations of those facilities, the spilling and generation of power would have to fit with fish restoration, they couldn't fly in the face of it. They would have to be operated in a manner that allowed for upstream and downstream passage of anadromous stocks. That means that they couldn't completely spill those lakes. They would have to change the way they generate power. The dams on the Columbia have had to alter the way that they generate power to coincide with fish passage. It

can be done. There are precedents for it. But I don't see any of those things happening. Realistically I don't see them happening. If those things did happen I think, yeah, under those circumstances go ahead and relicensed the dams for say another 25 years and lets see what happens. I think that would be a calculated risk but I think it would be a risk that I would be willing to look at and better than the current operations. It might be short of removing the dams but it offers some hope. It offers some promise. Not removing the dams and the status quo offers no hope. Mitigations in the form of money to do restoration projects in a localized area – land tenure, whatever, I don't think has anything to do with the issues.

VII. Harold Lewis (Joe Boy)
Allen Family, Orleans
Retired Logger, Age 60

[Controlled Burns and Basketry Materials] I think about when I was a kid, we had a ranch down below Martin's Ferry and every year in the spring time when the new grass come up, when the new vegetation started coming up, when the sun would come out it would fry the old stuff, we would control burn…I can still see them spots of where it was clear but there was nice hazel sticks and our cattle would be down in there eating grass and there were deer there. That's because we were able to burn it at the right time of year and nobody was afraid of fire getting away because it was done at the right time. I remember when I was a boy I'd be scared and look out and it would be backing right down there and everybody else would be asleep. But the old man and everybody else knew that it was just going to back right down to that trail there and stop right by the house. Now they're making criminals out of people that's trying to keep our ways. I see young people going up and down the road and some of them will throw a match out. I know what they're doing, and where do you find a balance of telling them that they can't do this but yet they're trying to hang onto something of who they are.

There's a few cattle down in there and they're actually becoming criminals. I was looking at it one day and said to my cousin, "Do you know these cows come at night and steal? They come at night because a lot of the grazing places is gone and they have to come by your house. I said, 'Look here, they're making criminals out of the cows'. What I'm getting at is that controlled burning did a lot.

VIII. Mavis McCovey
Elder, Whitey's Flat, Chimcinee
Medicine Woman, Retired Registered Nurse, Tribal Clinic

[Memories of Previous Fish Runs and Water Quality] [Floods] I moved back here to Orleans when I was six years old and I lived with my grandfather and he talked about the big flood of 1868 and he said that water jumped channel for a while and ran down to where it is now and it went back to where it had been. He said his father had a lumber mill in the field between here and Camp Creek. He said the water washed his mill out and he never made a mill again. He sawed boards for flumes for the miners and people built these board and batten

houses with them. At that time my grandfather was living next to the Indian village of Whitey's, but he was living with his father. There was a lot of water then. From what I gather there was a lot of water in the river all the way through the 1800's and in 1890 there was another great big what they called a freshet. I think it was a January or February flood. It didn't get as high as the 1964 flood but it got up below the Post Office in Orleans. These floods all came after the mining started.

The largest flood that the Indians talked about down here was the one in 1868. There was a lot of snow and water from what Grandpa talked about. The weather was fierce in the 1890's around here. If the high water wasn't high enough to flood the town, then they would just be freshets and no one would pay any attention to them.

[Pollution] So when I came here in the 1940's the water was contaminated. It had great big foamy things floating on the water. My Grandpa said it was from soap and stuff the farmers were putting into the water. There wasn't much algae. He said the Indians around here never drank the river water. You could drink Salmon River water then. Then the Klamath River got really contaminated in the Thirties. It got typhoid fever and everyone caught typhoid fever around here. **[Effects of Iron Gate and other Dams] [Memories of Previous Fish Runs and Water Quality]** Then the dam came, I don't know just when. But I remember at 2:00 the water would raise about a foot every afternoon. I think it was Tuesday and certain days when they'd let water out of that dam and that's the first I remember about the dam. **[Stranding]** In the springtime, I must have been around eight, nine, ten years old, the fish would get landlocked across the river from Orleans when the water would drop and we would just spend hours and hours packing the little minnows and putting them back in the river cause they were dying. That was an effect of the dam they said. The water fluctuated somewhat normally, but the dam was really fluctuating. The natural flow of the river would take longer.

People always blamed the loggers for what was happening to the river. It's the runoff from the logging. When I was older I lived down river to Pecwan and the water was beautiful and clear at this time. No grass, no nothing. I lived down there for 15 years. Up here the river was always murkier. In the Fifties the nets down there had quite a bit of moss in them but normal. By the Sixties people were starting to bitch down there because their net would sink sometimes. And sometimes they wouldn't even put out their nets no more because the moss was growing more. But the water flow and the size of the river down there was still approximately the same. After the '64 flood people hoped the river would wash out. Evidently this was the normal pattern because this was the normal pattern because these were older people. But that didn't happen. The water was very contaminated and people get sores from the water. Kids who played in the water would get impetigo type sores and staph infections.

[Salmon and Steelhead] The spring salmon run changed in the Sixties. The water quality was still real good but it was getting more mossy all through the Sixties.

[Basketry Materials] Now the water comes up and silts in around them [willows] because there are big bunch of them and sand comes in across these river bars. There used to be sand

on the river bar at the end of Orleans Bridge. There wasn't all those big gray willow trees. There was just clumps of little willows toward the edge. The basket weavers all started to complain in the Seventies that their willows were buggy. They weren't sending out new shoots and they just got buggy and it's because they were above the water line. The water had gone down. In '76 the creeks all started to get low and get sluggy looking, dark green oily looking. All over the river moss was growing. We all started swimming in the creeks. We didn't swim in the river no more.

Of course the drought has made the ferns go down because the creeks have gotten smaller over the past 25 years. We've had less water. Independent of the dam. They have gone into a drought period and people are using more water. When I was a girl there were four places on this flat and now there's 40 places, ten times as many and it's all up the river like that.
So there's more sewage, more septic, more water being used. Then they are trying to grow grapes around here, during a drought period and that's using vast amounts of water and they're taking it out of the river. We've got farms around here growing vegetables and that's taking more water. And where there used to be cattle ranches up here, now they're growing hay.

[Klamath Project] For the first time in my life the Salmon River is warm. The Salmon River was just about as cold as Camp Creek. All my life. And the Salmon River is lower than it's ever been. Partly rainfall and partly the water table being drawn out into the Scott. The water table is so low in the Scott that the water is going out into the Scott to keep the water table even. The low water flows now are lower than they used to be because of the dams. If they didn't have the dams there wouldn't be the increased water usage. I'd like to see them quit growing surplus potatoes in Klamath Falls. If they're going to grow grain, grow one other than alfalfa that uses millions of gallons of water. Grow a grain that's more indigenous to the environment.

[Water Quality and Water Temperature] In the sixties you'd go swimming about 5-6:00 in the afternoon and then the water would start cooling off. And then later in the sixties you could swim 11:00 at night and it was way warm like bathwater. And before when I was younger about 5-6:00 the water would start getting cold.

The fish don't even want to come out of the ocean until the water gets to a certain temperature. They must know the temperature of the river water that's coming out because they will lay out there in the ocean and they'll see them out there and they're not even trying to come in the mouth of the river yet. And then pretty soon something starts them and they'll start going in and out of the mouth of the river.

[Eel] They could catch 200 eels in an evening, those men down at Boise Creek, for our barbecue the next day. Just in the mouth of Boise, just in that one night. I was 8-9 years old (60 years ago). When I went down the river in '51, the eels in springtime, you'd see them along the river bar below Rubens, all along they'd be floating down the river. On both sides, eels just floating (dead). In the sixties they would be caught in eddies and there would be

thousands and thousands of dead eels floating in the eddies at Peckwan. By the 70's you didn't see them any more.

[Salmon & Steelhead] The fish are getting smaller because in the 50's and 60's when I lived down Peckwan they'd bring me fish and they'd be 20-25 pound salmon that they were catching down there. Now when we go down there and fish we get 10 and 15 pound fish. The fish aren't making it back to the ocean anymore, that's what's happening. Before the big fish made it up to Peckwan Creek and made it back to the ocean, because I was living at Peckwan. Now it's three year olds that are coming up and making it and going back out. They come to Blue Creek anymore but they don't make it to Peckwan Creek or Roaches Creek like they used to.

[Siltation] Sandy Bar, underneath the Orleans bridge, the big hole down below Hillman's, below Red Cap Creek [have been silted up]. Every year you would have to go and find out where the gravel was going to be.

[Mining Impacts] The other impact of mining was all the trees they took out to build the flumes for the mines. They did extensive logging.

[Siltation] Down at Peckwan when I first moved down there, you'd go swimming and there wasn't algae all over the rocks. Now in one of the main swimming holes you don't even swim anymore. If you can get through the duck grass you might be able to swim. I wouldn't go swimming anymore because of all the algae and stink. From all the stuff in the water you itch all over. They were still swimming there in the late Sixties.

They kept saying down the river there in the early Sixties and the river was silting in. I don't know what was silting in. They kept saying mining or logging had done it, or because the dams were in for 50 years and they were saying as soon as we get one high water here, that cleaned it out pretty good in the fifties. If we get a nice big water it will clean this water out and the nets were sinking because they were full of moss. Towards the end of August they quit setting their nets, fish were running and they didn't set it. Put it out there 15 minutes and the nets would sink with the moss. **[Natural Processes]** They quit and they kept saying, "When the big flood comes…", Well the big flood came and it didn't happen. It didn't really clean it out. These old people down there were saying it didn't clean the river out like it should have. They had that big flood and there was still a lot of silt. Sixty-four did not cure the silting in of the river between '55 and '64. During that nine years it silted up down there because the flood plain is not as steep as it is up here. It is flatter. Once you get down there below Lewis's it kind of flattens out all the way to the mouth. It's only about a hundred feet above sea level there and that's all it's going to drop for 30 miles. People didn't know why it was silting up. They complained that it cleaned out in '53 and '55 and the channels were good. Between '55 and '64 it was really getting bad and mossy and slowed down and was silting in and they didn't know what was making this silt in process happen, but it was happening. And they were hoping for a flood. The flood came and it didn't really clear it out. It never got the channels that it had before. That water down there used to be just clear like a creek, and now you look down there and it is kind of a dark, dirty olive green.

[Klamath Project] They found out that the wells around Klamath Lake lowered the water in the river and the lake. It was like pumping it out and spitting it back polluted.

They've got duck grass clear down to below Drake's Riffle now. We never had duck grass here.

[Population Pressure] There are so many more people. We used to have four or five people on Whitey's Flat, now we got 50 houses on Whitey's Flat. It's like that all up the river so they're all using water

[Memories of Previous Fish Runs and Water Quality] [Water Quality and Water Temperature] [Controlled Burning] I remember when I first moved down to Martin's Ferry, you'd drive to Hupa in the evening in the spring time and the whole hillside around Martin's Ferry would be all burning, kind of dying out be evening time. Go on all the way up the river and you'd see along the Hupa Bluffs, all along on this side they were all burning, about a mile up the hill they were still burning and it was kind of glowing because of evening. You'd see 30 miles of hazel burning.

The prairies are getting smaller and smaller. The trees are coming down into the prairies because they're not keeping the grasslands burned off. I think the brush has an effect on the water available for the river because the brush on my property has gotten ten fold as high and Whitey's Creek. I would say it has to be taking the water because the water don't get clear down to Marion's like it used to. It used to run clear to the river, now it don't. That creek used to run to the river and it don't now.

Grandpa said when he was a little boy about eight or nine years old he'd have to go look for the cows up above Hillman's, what used to be the Ferris Ranch Hillman place and he'd go up there to look for the cows in the brush and stuff and underneath the trees and he said all the little conifers on Whitey's were as big as little Christmas trees. They were just starting to grow and that would be in about the 1870s and there was no conifers growing down there before that time or up on that ridge where I live, there weren't many trees. They had it all burned off.

IX. Scott Quinn and Toz Soto
Scott Quinn – Wilder Family
NEPA Coordinator, Karuk Department of Natural Resources
Age 25

X. Toz Soto – Black Bear Ranch Family
Fisheries Biologist and Fisheries Program Manager
Age 30
Quinn [Water Quality and Water Temperature] I would imagine that removing the dam(s) would have some effect. Jenny Creek flows into Iron Gate now, so if they stop that there would be a lot of benefits. Plus those reservoirs are heating up the water in the summer

time and releasing that water…We're mainly thinking about wintertime, like how much sediment's coming down. Like right now one of the common thoughts is that there's a lot more sediment coming down. Like when I went up and looked at the Scott, the Scott River during the winter there was a storm in December and we went up there and there was all kinds of sediment coming down. I have a turbidity meter and I can measure how much sediment is coming down and there is a lot. One idea is that when too much forest is cleared or you have too many roads then you have a lot of runoff. Instead of the rain hitting the tree canopy and percolating down into ground water and increasing base flows for summer releases, more water runs directly off into the river. Typically you can gauge the condition of a river by looking at,…if your winter flows are way up here and your summer flows are way down here, that's not a good thing. But if your winter flows are kind of down here and your summer flows are more moderated, then your watershed is probably in better condition. As far as turbidity, what we're trying to get at is whether people have seen it getting dirtier over the years in the wintertime from storms and how fast it clears up. Maybe it cleared up faster before. Maybe it takes longer now.

[Fish Passage] One of the problems we have is trying to tease out the effects of PacifiCorp and their operation of those dams, but there are certain assumptions that we can make. One being of course the fish passage issue, the other the water quality issue-holding back the water and releasing out warm water later into the fall and then the effects of them taking all the spring water so instead of having spring flushes they are holding it all back so they can divert it to farming.

Swimming in the Klamath will infect any open sores you might have.

Soto [Geomorphology] The geomorphology of the Klamath River is like night and day because the water from above the Scott is coming out of spring-fed systems without a large rain influence. It is more of a snowmelt, spring-driven system. The '55 flood and the'64 flood were two different animals. Between 1955 and 1964 many roads were built resulting in a lot of sediment inputs, a lot of disturbance of the landscape combined with big fires. From the Scott and the tributaries, Beaver Creek and a lot of those roads. The major rain-driven tributaries are Horse Creek and Beaver Creek. But below Iron Gate you are coming out of this volcanic plain. **[Natural Processes]** It is less of a rain-driven system up there. It is more of a stream/snow-fed system so the scour and actual peak flows are moderated and Iron Gate is less of an influence up there.

It makes sense that '55 scoured the river out and '64 filled in probably because there was far more input off the hill slopes from the logging and other management practices than pre '55. Pre '55 there hadn't been as much, then there was a big boom in the Sixties and after '64 you didn't have a recovery from the flood and you kept getting constant road building type disturbance. The influence of the dam during peak flows is fairly minimal down here compared to the influence of the Scott River and the other tributaries. The most important flow for fish is that sustained spring flow which is not a peak flow. It is not a scour type flow. Freshets are after a rain event when the river rises. Dam management has eliminated this effect. You have a flat line geomorphology. On the one hand there is the natural hydrograph

where there are peak flows like in ’55 or ’64 or ’97 where things just fly off the handle during a flood. Most of that water is coming from the Scott and the other tributaries. What I see from the Scott River below Iron Gate Dam is not heavy sediment. It is not heavy sediment. It is pools that fill up with organics, which doesn’t take a lot of flow to move it out.

Quinn Your natural hydrograph is flat lines with bumps with each bump being a freshet or flood event. What we have now is a flat event.

Soto Even without the dams, the bumps on the hydrograph would not be as dramatic above the Scott River. Below the Scott River it is going to be a larger bump.

Quinn If you look at the Shasta River a lot of that water is coming off the south face of Shasta, its flows are moderated. You’re not getting the huge winter flows or the real low summer flows. It is moderated because a lot of it is driven by snow.

Soto [Water Quality and Water Temperature] When it’s raining here, it’s snowing there. Back to the issue of freshets, that’s important because it is important to get fish moving and it’s important to scour the organics out of the river. We have these dead zones in a lot of these pools where it just settles out and you can tell there hasn’t been substantial flows in a long time. These places are eight feet deep with muck. A lot of it is just heavy organics that is low in oxygen. You’re not going to have micro-invertebrate populations in there. A lot of it is dead. It is silt that smells like rotten eggs. That development is due to a lack of scour flows, which come in the normal natural hydrograph.

Quinn And overabundance of materials from having warm waters in the summertime.

Soto Right and the other thing is the issue of water quality. All that stuff just settles out. There is a lot of flocculent. That is the stuff that comes out of these reservoirs. It is algae and agricultural run off. If you filter river water through a fine mesh, the river might look green but you are going to get stuff that feeds polychete worms and things like that that are hosts to diseases.

Soto [Effect of Iron Gate Dam on Cultural Resources] So my question is, how come if you look at village sites like Amikiarum, why do you have sweat house pits being eroded down to the river when you know these pits have been there for thousands of years and all of a sudden different events are scouring them away?

You’ve got 20,00 miles of roads out here and our peak flows are higher than they used to be because you have run off response. You don’t have…

Quinn Its not infiltrating into the base flow of the ground water.]

Soto You have had high intensity fires in a lot of places that have denuded the hillsides and your peak flows…

Quinn [Effect of Iron Gate and Other Dams] You remember what Mavis said about being able to swim in the river in the Fifties and you couldn't swim in it at night because it was too cold. Then she came back in the Sixties and it had warmed up to where she could swim. That had something to do with Iron Gate. Because before Iron Gate the water was colder at night time. Maybe that was partially due to the influence of Jenny Creek and Fall Creek, cold creeks which are now behind the dam. Maybe those creeks and streams that come in above Iron Gate were having a cold-water benefit at nighttime. And probably less development too in the Scott and Shasta.

Soto The diurnal temperature fluctuation of water released from Iron Gate is minimal. You've got a big giant pot of water there that's hot and gets hotter and hotter through the summer.

Quinn Right now (early September) is when those reservoirs are having the biggest effect on the river as far as temperature. They're still putting out warm water and we're having cold nights now and we should be seeing some diurnal fluctuations in the water temperature.

Soto Its arguable whether Iron Gate has an effect on the temperature all the way down to Orleans. How long does it take the water to get here? Three or four days? At real low flow it takes longer. **[Floods]** What I noticed after the '97 flood was a lot of channels that were wider and shallower. That's a combination for warm water. When you flatten something and take out your depth and lower the velocity…Elk Creek had a diurnal variation of 12 degrees. **[Riparian]** So at night it was cooling off a lot but during the day there was no riparian canopy. A lot of the canopy was wiped out in the floods and a lot of your channels became wide open. Both '55 and '64 scoured these riparian channels. It's rare you find a riparian corridor around here that has mature trees along it that didn't get wiped out. Look at the mouth of Ti Creek for example. Before '55 it used to go meandering around a camp ground through old growth trees and a mature riparian area and come out about a hundred or two hundred yards above where it comes out now. Look at pictures after '55, it just blew right through the bar right there and now there is absolutely no riparian cover there and the channel has been shifting around every since. Because it keeps shifting around there has never been a really good riparian area able to establish itself down there in lower Ti Creek.

Quinn There used to be boulders starting at the bottom of Ti Creek, bigger material than there is now.

Soto Highway 96 and Ti Bar Road are sitting on top of the old channel. At Rock Creek and a number of other places the channels have shifted considerably in direction and that's going to have an effect on the temperatures. **[Floods]** Then you throw onto that the effects of the reservoirs and I know there was a lot of disturbance in those floods that had something to do with warming them up. If you look below Iron Gate Dam now things aren't scouring out down there. The river doesn't have much character other than cows on the bank and things like that. If you look at the mouths of creeks down there and it just doesn't look healthy. There is a lot of algae. The bottom line is you can not throw a dam on a river and expect it to function like it did before. Iron Gate is just an extension of the other dams there. I'm sure that

when you loose the influence of Jenny Creek and whatever other creeks come into Iron Gate Reservoir, then you go above Iron Gate and you come onto Copco which has the same influence as Iron Gate except it just happened a few years before Iron Gate and it has just been a progression.

Quinn You also have to look at the level of the water at the creek mouth pools, whether it makes it bigger.

Soto [Thermal Refugia] You shouldn't need the thermal refugia. The river is in poor shape and the fish are just hanging on. It isn't normal for 3,000 or 10,000 fish to hang out together in the mouth of a creek.

Quinn You think the whole river should be cold enough for them in the summer?

Soto [Salmon and Steelhead] Yeah, yeah. Of course there are thermal areas and they are reduced but typically the fish would probably move into a riffle in the afternoon when it got hot. They would sit in a riffle where there is better oxygen. They wouldn't have to go find the mouth of a creek. In the Salmon River most of your fish would move into the riffles during the hot part of the day but not crowd like into the mouth of Indian Creek spreading disease with each other.

Quinn When looking at the Salmon River I was amazed at how many fish were hanging out not in the mouths of creeks but in the riffles.

Soto Well in the Klamath I think that it's hostile territory for these days. Especially for a period of time in the summer when a hot spell comes through starting as early as late May if we have poor spring flows but generally it happens in late June, July and August. But I don't think these thermal refugia were as big players in the old days. Certainly there might have been drought conditions in some years. You have cycles, drought when the rivers were low and the temperatures were high, combine that with some other disturbances that happened, there might be a time when the refugia were really important but to see every single year you see fish crowding into the creek mouths. That to me is not at all a sign of health. I think the Klamath warmed up critically after the dams. After the dams I can say that it stays warmer longer. In September you drive up the river on a nice crisp morning in September or October and there's steam coming off the river from Weitchpec all the way to Iron Gate. Then you drive by the Shasta River and it's cold as ice. The Klamath takes a long time to cool off. You look at our water temperature data from '92. We have a report that shows that Iron Gate Reservoir holds water temperatures higher for longer. Instead of cooling off in early October like the rest of the tributaries, including the Shasta. The Klamath stays warm for spawning all the way up into the third week of October then these other tributaries including the Shasta are cold and you can see it. I've never seen steam come off the Salmon River. And the closer you get to that dam the more steam you see coming off the river in the early morning. If you look at these models the USGS came out with you can't argue with that. You have fish that are going up there to spawn and they are intuitively going to the dam because that's the last place

to go and they are sitting there waiting to spawn and they can't spawn until the water temperature gets to a suitable level.

To be successful the water has to be at the right temperatures and if you have elevated temperatures at spawning time you have a lot less success with the spawners up there. If the fish spawn in warm water you will have less productivity out of those fish. These are big heat synchs up there essentially and it is going on right now. You can see that every year. That's just the fall fish and you have no spring run up there. There used to be fish in the river all year round. The fish that were spawning came up earliest and went the farthest and went up the Williamson River. That's a long way to go. But they have to get through Klamath Lake and the river during this stressful warm period so they go early and hold up there in Spring Creek and some of the spring fed areas up there are like 10 degrees Celsius. That's like hog heaven for fish and now they aren't getting up there at all. There is no passage and they haven't gotten up there since the first dams around 1917.

That brings up a whole series of new issues. Those juveniles that are up there, those are 18 month to 24-month residency in the river system. They used to catch a run of salmon that was the size of a half pounder. Those were probably out migrants that probably sat up in Klamath Lake all spring, got fat as hell and those were a winter run or spring run salmon that were just on their way out to the ocean. These were 18-month-old Chinook that grow pretty fast and Klamath Lake could have been really rich with insects and other food and fish can grow pretty fast. Fish can grow up to an inch a month when they are feeding so they were probably using them as a fishery here. If you imagine a watershed and you cut off the head of it, those salmon and steelhead are the last fish to leave the system and they are the first fish to come back. I can guarantee you those early season fish were a very important food source because they had tons of fat. A fish that is going up to the Williamson River and is passing through here is going to be fat. It is a matter of get fat, enter the river system, and get up to that good cold spring water. They are just like bombs. Talk about the loss of a food source to the tribes today. We are relying on the Trinity Hatchery run for a spring run now. The Klamath run doesn't exist, but can you imagine if there were springers still running through here, the economic benefit to that? Economics, food source, you name it man. The loss of this run carries a huge cost. The dams are blocking migration of the spring run and it is also creating a water quality problem that basically kills every springer that goes up there and tries to hold under Iron Gate.

Quinn Is that because in the springtime they start holding back the water in March and April?

Soto Yeah. Basically we have water quality problems up there and the natural holding area of the spring run was probably up the Shasta River and I don't know, but the temperatures might have been a lot cooler up there year round. I don't know what the historic temperatures were at Iron Gate but everybody tells me about a 200 or 300 cfs flow coming out of the hillside. Man if we had 200 cfs coming out of the Salmon River right now and it was 10 degrees centigrade there would probably be thousands of Chinook down to Ikes Falls, all the way down to Orleans, a big slick of them. That's every fish's dream to have. That's a lot of water

and a spring source is a consistent source. It's not one of those things that is on a hydrograph that is going to drop down and go up. Those fish can hang their hats on those temperatures.

Quinn We need to start paying more attention to what kind of Forest Service activities might affect those spring flows. If they start heavily logging the mountainside to where it's not going to store the water…

Soto The hillsides burn up there. You have white fir coming down to elevations…and you see tree densities up there that they've never documented. The snow doesn't even hit the ground! They have so many trees up there they just don't let it burn. It's not under a natural fire regime up there. The Upper Basin is flat as a pancake and you can surpass fire up there to a point. I think that's something that you've barely scratched the surface on as far as snow retention and the spring flows. I'm sure that the Klamath's [National Forest] burned the hell out of it.

[Natural Processes] There is no doubt that the fish population is greatly reduced, but the other thing to remember is that it doesn't take a lot of fish to reseed if you have a healthy river. The biggest limiting factor for fish the period when that fish goes from egg to out-migrant. The eye stage [of the egg] is probably the most critical time. You can have great numbers of fry out there, but if you have crappy flows and poor water quality the population will be hard hit and you'll end up with just a handful coming through. It's a matter of your "seed" having to germinate even to get to the ocean. They can knock the hell out of them in the ocean but if you still have a couple of thousands of them coming back, then production should be increasing. If we improve the conditions and certainly manage the fisheries, but starting at ground zero, first things first, which in this case is just getting the fish to where they should be for fish passage.

[Dam Removal] I don't know if you can retain the dams and solve the water quality issues. There might be a thermal barrier. I'm sure you could build some kind of fancy fish ladder and get fish past the dams. I don't know if you can get them back out. And I don't know if you can solve the water quality problems with the dams in place. Because the Klamath Basin is naturally a desert up there. It's hot. It's open and if you don't have these springs and marshes functioning and they are being drained, impounded and warmed up and the reservoirs don't really exist anymore, I don't know if you can solve the water quality problems with the dams in place. If you look at the Klamath River in a Klamath Basin context it is kind of right there on the edge anyway. Klamath Lake was shallow. It probably really needed those springs and their influence in the reservoir reach to bring it back into shape after coming out of that lake. Because that lake was a pretty productive system up there and you add in Lake Iwana and all the reservoirs below it, plus Lake Shasta, it's not…I don't think the water quality problem is going to be solved as easy as the fish passage problem without getting rid of the dams or reducing them significantly or making changes so they don't use a reservoir to generate their power.

I think there is some high quality water coming into those reservoirs from springs that is not influential in the system any longer. You can say that there is poor quality water coming out

of those reservoirs but if there is 200cfs of good quality cold water coming out of those springs, and other creeks up there, maybe 300 cfs total, coming in, then to me, Klamath Lake could completely dry up there…

Quinn They say that during the summertime it would actually disconnect and you had all those marshlands and all of a sudden there is a lot of evaporation and once the snow stops melting and that lake starts going down a little bit that natural dam would kind of keep that water…

[Soto] It sounds to me like there is a lot of influence down below Klamath Lake that is pretty good water and may have been even the dominant influence during the critical period of low summertime flows.

The effects of the dams include the loss of spring Chinook. We have lost a number of different runs of fish including out-migrant fish. That is a matter of fish passage, but those fish didn't just drop off the table. They fell off major in the Sixties once they put Iron Gate up. There was still some cold-water influence until Iron Gate went in. There is no spring run anymore and if this was back in the day, people would starve. Taking out Iron Gate is not going to solve it completely. We need to hit the water quality issues. Fish passage alone is not going to do it. You have to solve the water quality issue and the fish passage issue with the reservoirs.

[Quinn] The positive influence of the streams and springs coming in between the lake and Iron Gate are being negated because of the impoundments. The freshets were a lot cleaner. In the winter storms are going to wash dirt into the river but if there are spring freshets from snow melt that is easing down to the river it is a lot cleaner. I'm sure that now even the freshets are dirtier than they used to be.

XI. Ron Reed
Ti Bar, Davis Family
Dance Owning Family
Cultural Biologist, Karuk Department of Natural Resources

[Wetlands] Approximately 80% of the wetlands in the Upper Klamath Basin are no longer in existence. Either they have been drained or they are farmland. That has a profound effect on the Lower Klamath Basin. The peak flows now occur during the winter instead of the spring since there are no wetlands in the upper basin. The wetlands acted like a sponge during winter storm events and absorb the water holding it for a period of time until they are saturated and then there would be a flow into the Klamath. Now instead of water being absorbed by wetlands it runs over the dams and the peak flows result in winter. This has changed the dynamics of the flow. The hundred year events have subsequently become 25-year events. Ten-year events have become four or five year events. The catastrophic events occur more frequently now because of the amount of water that is flushing through the

system at these times. **[Gemorphology]** This creates a regulated geomorphic effect. If the dams weren't there and the wetlands were, you would have the spring freshet system with peak flows during the spring. With more water stored in the wetlands there would not be as much water flowing. When the water comes down unnaturally in a dam-regulated flow it accumulates and scours out the riverbank and that's where all our village sites are. If the dams weren't there and the wetlands weren't disrupted then those villages that have been in place for thousands of years wouldn't be damaged in this time. The regulated flows channelize the Klamath all the way down to the Scott River. Around there is where gravel bars begin appearing. That tells you there is a functioning flood plain above that area. I think how the bed load is being transferred needs to be looked at. Further down the river point bars start appearing.

[Siltation] The sediment load gets transported down to our country. At the creek mouths are big alluvial fans that are brought down when the flow is at a catastrophic level. When the water recedes now you have a steep embankment without the scoured out creek mouth. **[Water Quality.] [Natural Processes]** Now the system is overloaded with nutrients causing the algae to overtake the river. This creates embeddedness in the substrate. We have seen an increase in algae in the spawning beds. This is an accumulation of algae that hasn't been flushed out for years. In the past the spring freshets would clean that out every year. Now you have the big winter flood events and after April first the Klamath Project irrigation goes into operation without having a freshet precede it, which flushes out all that sediment. I attribute the dwarfed lamprey to that because there isn't enough scour up river so those baby eels aren't flushed out down to the ocean. That's the difference between a resident trout and a steelhead. The resident doesn't get flushed out to the ocean. And what are the effects of that poor quality water on the fish trying to enter these streams? It's not just PacifiCorp, there are other things going on out there upslope that need to be considered too if we are going to get back healthy fish populations. It's sedimentation from Highway 96. It's Forest Service management. My goal is to get all these agencies together in a holistic way to look at these issues.

[Effect of Iron Gate Dam on Ceremonies] The Karuk people manage their resources by way of ceremonies and traditional rituals. There was the First Salmon Ceremony with taboos associated. It was taboo to eat steelhead before the Pikiawish. And there were four ceremonies in which the Medicine Man needs to go down to the river to bathe. From early July right on through September. They need to bathe in the Klamath River for ten days at a time –up to three, four, five times a day. So there are associated health risks there with polluted water. Another issue of water quality and the ceremonies is the loss of species such as crayfish that are needed to make the medicine. These were conservation methods.

Each village site was associated with a fishery. Each village had a handful of fishermen. Techniques were used that took only a fraction of the run that was going by at a given time. That was the way we fished all the way up past Siad and all the way up the Salmon River. We believed that if we took care of our fishery we would always have food. If we didn't manage our fishery right something bad would happen. People would die. So we evolved with that concept. Conservation was the goal of the ceremonies, was the goals of the way of

life and it continues that way today. We're still striving to do those same things, trying to figure our how to introduce it to the modern society. The closer we can mimic nature is the best method possible. Like for instance right now. The first of September is upon us. They just released a bunch of water for the fish, but the temperature is 106 degrees. I think that was a very inopportune time to send water down the system. But if we had a storm event, which I hear is going to happen this weekend, if they could look ahead to when a storm is coming and then send the water down so there would be a cool pulse coming through the system, not another stagnant warm pulse…I know it is not always possible but when it is possible you need to mimic nature because that is what the fish evolved around – barometric pressure. When the cloud cover comes in the fish know it and if there is cold water coming down it will stimulate them. There needs to be a more holistic understanding of management processes and cycles.

[Basketry] The river channelizes right below the dam due to a higher velocity of water shooting down the channel during the high flow events. There never used to be the large willows growing along the river and that affects our basketry materials. They used to get scoured out in the spring. Even when new shoots come up they are not as delicate as they used to be. The growth patterns are different because of increased nutrients in the water. Until the water managers understand that everything is connected we are going to get these problems within the ecosystem. What effects is this going to have on the basket weavers? Are the shoots they are putting in their mouths affected by the poor quality water? What about the heart problems and diabetes that tribal members have. That might be associated with the lack of salmon in their diet, a food we evolved with and now we have all these starchy foods. I'm not trying to point the finger at anybody; I'm just trying to figure how this affects Karuk people and how we can make it better for the next generation.

[Salmon] Now there is so much pressure out in the ocean that we're getting predominantly three year old fish coming up that we harvest, and before they used to be four or five years old. But now there are so many impacts out in the ocean that it is harder for these older fish to survive the onslaught of the nets out there. So that's part of it, right along with other components. It is not all the impact of the PacifiCorp Hydroelectric Project. There are several dams including Iron Gate that need to get taken out, but its not going to be like a magic wand that will be able to start our fish populations or our eels back up again. I think it is a cumulative effect and there are a lot of different things adding into the problem that we're faced with today. The river right now has a hard enough time trying to support the amount of fish that are in it right now. One of the big issues we have in this relicensing process is trying to get fish past into above Iron Gate Dam, adults. There is over 150 miles of spawning habitat up there. That's where the big population of fish went. It is not there any more. That is no longer spawning habitat so that population dwindled.

[Water Quality] The next cold water below Iron Gate Dam is 20-25 miles below. So what happens is that you have 25 miles of river and that's a long stretch for a fish to make in one day. And once the fish makes that trip in one day, he's gonna need some shade, a resting area and there is no resting area at that dam. There's no cold water, so there's a strategically located [cold water refugia] that is not there anymore. They get up that far and it's like the

middle of the desert with no water. If that dam isn't there that fish makes it up, not only to a potential spawning ground, but to a functioning river as a cold water refugia for them for holding areas.

I know that when I was a kid fishing at Ishi Pishi Falls we'd be done fishing by Labor Day. We'd already have enough fish. We'd be tired of fish. But now we don't get started until after Labor Day. When they put in Iron Gate there was spawning above where Iron Gate is now so there was a substantial amount of fish creating that run we're talking abut now. The elders tell us there used to be fish in the river all year round and I think the dams disrupted that pattern of migration.

[Creeks] The small creeks that barely have any water going through them right now, people are telling me there used to be good runs of steel head or winter runs of dog salmon went up the creeks.

I would suspect that following hydraulic mining and before the dam we still had these spring runoffs which would scour out these holes and kind of counter the effects of mining. Spring floods effectively quit when they put the dams in. If the spring floods scoured everything out, cleaned all the mining effects, but with a regulated flow you're not getting that.

[Siltation] The sediment is settling out in these deep holding pools that are our swimming holes and that the salmon used to use when the water would get to lethal temperatures because you'd have stratification with down at the bottom cool because it was deep. But now the water is shallow and it is all warm. That's why they cram right into these cold-water refugias. All the deep pools are now filled in with sediment and algae growth. If the river was a healthy system there would be a better economy in this area. As it is our young people have to move away because the economy is so bad.

The Yurok fisheries are seeing algae in the estuary now. Something their elders told them never used to happens.

XII. Phil Sanders
Orleans Resident

[Water Quality/Mining] I was interested in how much effect historic mining had beginning around 1850, particularly the decades from 1890 to 1910. Going back to historic data, there were 33 hydraulic mines working between Somes Bar and Weitchepec. We calculated surface area of the mines from aerial photos of four mines on Orleans Bar Gold Mining Property. They weren't any bigger than the other mines; it is just that those four were operated by one entity. We calculate the amount of material that would have come off these mines based on the existing head wall heights and overflows in those two decades and came up with 9,000,000 cubic yards, approximately three times the volume of the great pyramid, which is 750' on a side and 500' in height. That is from just four of the 33 mines operating. There was the siltation as well as the significant water diversions needed to accomplish mining. There was not only the direct diversion of water at the time, but also the erosion of

those ditches as they deteriorated over time causing erosion in areas where there would not have been a surface flow otherwise. Also there is anecdotal information about how many salmon miners killed for subsistence.

This was made worse by the dredging, which only took place in 1940. The combination of dredging and the 1955 flood caused the river to change course here. The first substantial diversions from the river began around 1890 and the Copco Dams came in around 1950 so there is a lot of accumulation of effect. There isn't as much water as there once was.

In the late Sixties I used to dive for fishing tackle on the bottom of the river but by the Seventies I had to give it up because of the algae growth had gotten so bad that we could no longer effectively find fishing tackle at the bottom of the river.

[Controlled Burning] The encroachment on the landscape by Douglas Fir…We can identify stand after stand of 120 year-old Douglas Fire around here and the transpiration loss from the Douglas Fir has to be tremendous and that can only get worse as they encroach upon the open areas. I think that is another facet of the loss from the tributary watershed is from the encroachment of those Douglas Firs.

XIII. Ora Smith
Orleans, U.C. Berkeley Graduate, Retired Teacher

[Eel] There were wild hogs running around the edge of the river and they would eat eels and become crippled at that time of the year.

[Salmon] If you looked down river you could see the salmon coming upriver.

XIV. Renee Stauffer
Middle Klamath Subbasin Restoration Coordinator, Karuk Department of Natural Resources
Basket Weaver,

[Steelhead] In the Sixties the river was filled with fishermen catching big, big steelhead. Steelhead were big, they were huge steelhead and we don't even see them anymore.

[Thermal Refugia] [Silting of Pools] One thing is that they used to change. Every year you would wonder, "I wonder what it's gonna be like this year?" Now nobody swims in the river anymore. The water will give you parasites. It seems like even when I used to swim in it, like say this time of the year, the river didn't look like what it looks like now. Now it looks like stagnant water there, even though the water was lower, it still had movement. That was in the fifties. We'd swim down here by the bridge and it was all sand. There wasn't the big willows growing there. Now there is vegetation growing up that didn't used to be there and the algae and stuff growing in the river making access hard.

[Water Quality] At Amikiarum there's that big ditch that goes along side of the Creek.

[Indian Land Management] We know that it's science, but they don't know. The Karuk people have survived managed their land for thousands of years. And how long has it taken the White man to come in and destroy it? What does that say about their land and water management? They come in and they try and play God and they've ruined everything, threw everything out of balance. And I don't see anyway to fix it because there's too many of them.

[Basket Materials] If you look at old baskets and see how fine they are. I mean they are fine, you can't find sticks like that anymore. They are big and clunky. If you don't have materials that are really fine you'll never get fine baskets. Even the spring growth now is way bigger than it used to be. Cause we always look at those baskets and we go, 'How did they get that so fine?" People are not making fine baskets anymore because you can't get the materials.

XV. Harold Tripp
Traditional Fisherman, Cultural Technician Karuk Department of Natural Resources
Age 53

[Water Quality and Water Temperature] [Klamath Project] Well, I think the river gets too warm. The main reason is we don't have the storage in the mountains like we used to. We don't get the big snow packs that kept the river flowing and those dams kinda can be used to regulate water for the fish, as well as for the farmers. It can't just be for the farmers. All the fish are important and they should try and help the fish. That's what I've seen the water do. When they release it the fish come. They lay around all summer in cold pools of water trying to stay cool and as soon as the river comes up, here they come, every dang time. And last year they even got well. All them fish were sick because they were bleeding, every time they hit the net they would be bleeding before you clubbed them. And after the river came up, about ten days later the fish got better. So I think that if they wouldn't have released the water I think a lot more than 30,000 fish would have wound up dying. They had some kind of big boils on them, some of them too, like a blister.

[Fish Passage] I think it would be great if the fish could go further up. Seems like a person could figure out some way of getting them around [the dam]. It would be a good thing if the dams were out and the lake could become natural, but one thing they've done up there in Chiloquin is cover up some of their other, smaller lakes that were all over around there that kept water stored for fish because the way them ponds were, they were like bottomless ponds. They kept feeding cold water to the river. That's what the hell they were for; that's why the Creator put them there. But that's all gone now so they won't have that. These little lakes and all the wetlands have been covered up with dirt and have hay planted on them. All the wetlands around there got destroyed.

[Dam Removal] But I ain't trying to defend the dams. I'd like to see them taken out because them people that are running them are assholes. But I also can see a benefit for the fish because all the lakes are taken out even in Yreka and Shasta there's no more of them ponds, covered them all up. Well there's a few, one here and there, but they used to be everywhere. This makes a difference in the temperature of the water in the lake. Another deal is I don't know why, when they do release water out of the lake, why don't they release it off the bottom. It's probably not possible but I don't know why they don't think about that kind of thing. They didn't think about nature, how they had things set up. But if they had that sucker so they could release cold water off the bottom, y'know, maybe they could even have a way so fish could get through there. That dam is too big now, but I don't care, they could tear it out, if that's what everybody wants. I like the idea about people caring about our fish and wanting to come up with a solution. If that's taking the dam out so they can come back.

[Salmon] See, we've got to have survival of the spring fish. The spring fish are the ones that come up early and they go all the way up the Spraig River and all up there. And that's Nature's way of doing things too, because if you do have high flows, you're gonna have fish that do survive because in the headwaters you don't have big high flows. That's why all the fish go into the creeks. Grandma said fish never spawned in the river. They all went to creeks. That's why different people believed that they were their fish. People that lived at Wooley Creek got rich because the fish would come up there and they made medicine for them so they figured they were theirs. They figure the Creator is sending them fish. Grandma [Bessie Tripp] always said they believed there were different types of spring fish, like different clans, different families do things a little different or look a little different. She said there was a lot of different kinds of fish.

Spring Salmon used to come up in May. That's when we start fishing up there in the chutes. That's why we had such a tough time trying to come up with when the first Salmon Ceremony should have been down here, cause you wait for the first fish during the ceremony but you got to be pretty close, otherwise you could be there forever before you could… because you gotta catch a fish. And then there was a rest period and that's when the Jump Dance started, after that…So that's the only effect I know of any cultural resource is the fish. I see how sick they can get when they got warm water. That could be a problem if you had the dam out and you couldn't help them with some cold water, or more water. And I think it will happen, because like I say, Nature ain't allowed to do its work anymore. Man has messed things up. White man especially cause they think they're so smart.

I don't like those people that run the dams because they're not real, phony. Money.

SECTION III
The Effect of Iron Gate Dam on the Cultural and Natural Resources of the Karuk As Evidenced in Fish Passage and Water Quality Studies

The preceding sections of this paper have detailed through archaeological, ethnographic and anecdotal information the immense span of time which the Karuk have lived in the Klamath Basin. The purpose of this explication has been to establish the depth and intricate texture of the adaptations to the specific circumstances of this environment by the Karuk and other tribes of the Klamath Basin and river. This highly evolved set of lifeways insures that whatever effects the environment will also affect the ability of the Karuk and other tribes to sustain themselves and their cultures. As the subject of this paper is the effect of Iron Gate Dam on the cultural and natural resources of the Karuk, it follows that those resources most directly linked with the state of the river have taken priority in this study.

The Project Area

While the subject of this paper is the effect of Iron Gate Dam on the cultural and natural resources of the Karuk Tribe, the study of necessity includes areas falling both north and south of Karuk Ancestral Territory in that to the north lies Iron Gate Dam as well as the Klamath River wetlands, and to the south the health and vitality of the Klamath River continues to be impacted by the presence of the dam and by water release policies determined by the BOR which affect anadromous fish migrating upriver from the Pacific.

The Dams

With the construction of a series of dams beginning in 1917 and with the completion of Copco Dam No. 1, salmonids were with increasing finality blocked from access to more than a hundred miles of spawning grounds in the Upper Klamath Basin. Some years earlier, but in the same historical period of agricultural expansion, earlier constructions including the Lost River diversion canal and the Chiloquin dam began this process of limiting access of anadromous fish to the Upper Klamath River Basin.

Issues

The range of issues concerning the effect of Iron Gate Dam on the cultural and natural resources of the Karuk are quite complex, extending back through more than a hundred years of significant negative impacts on the fishery and water quality of the Klamath River. Distinguishing this range of historic and current impacts which are a consequence of the presence and operating policies of Iron Gate Dam from those which are the result of other factors is a central task of this study.

Published in 1931, but with research initiated in 1919, John O. Snyder of Stanford University wrote what he termed a "digest of the work accomplished in a salmon investigation conducted under the authority of the Bureau of Commercial Fisheries of the California Division of Fish and Game" (Snyder, 1931). Snyder quotes from an undated paper by R.D. Hume who reported:

> In 1850 in this river during the running season, salmon were so plentiful, according to the reports of the early settlers, that in fording the stream it was with difficulty that they could induce their horses to make the attempt, on account of the river being alive with the finny tribe. At the present time the main run, which were the spring salmon, is practically extinct, not being enough taken to warrant the prosecution of business. The river has remained in a primitive state, with the exception of the influence which mining has had, no salmon of the spring run having been taken except a few by Indians…and yet the spring run has almost disappeared, and the fall run reduced to very small proportions, the pack never exceeding 6000 cases, and in 1892 the river produced only 1047 cases (Ibid. p.19).

Although nearly a century has passed since this research was conducted, Snyder's discussion includes dynamics that are still impacting Klamath River salmon. He refers to the fact that in this period not only were observations of depletion ignored, some even claimed that salmon runs were "gradually building up." This is an early example of a recurring tendency of vested interests on the Klamath ignoring the reality of what was happening to fish stocks in order to promote their own positions, in this case the interest is that of concerns in commercial fishing.

Snyder cites the original depletion of Klamath salmon, following arrival of non-Native people to the area around 1850, to have been the taking of large numbers of spawning salmon by spears and other means as reported by the "old miners." By 1912 three processing plants with no restrictions had been located in the vicinity of the mouth of the Klamath.

In a statement prefiguring current environmental opinion by 75 years, Snyder asserts, "The fishery of the Klamath is particularly important, however, because of the possibility of maintaining it…(Ibid.)". This is a comparative evaluation as Snyder foresees development of the reaches of the Sacramento River in all its forms - commercialization, damming of tributaries, irrigation of the valley, pollution and the introduction of competitive species. As

we have seen, in fact, Snyder's assessment has proven to take in the range of negative impacts, with the exception of introduced competitive species.

Snyder also makes what must be one of the first scientifically framed references to the effect damming had on both minimum flows in summer as well as the control of "the violence of spring freshets" which are at other points in this paper discussed as having been vital for flushing out the bottom of the river and the maintenance of cold water refugia in the Klamath which has always had potentially lethal temperatures for migrating anadromous fish in times of low water and high temperatures if these refugia are lacking (Ibid p. 19). Snyder further observes, based on interviews with fishermen and "old residents", that prior to Copco Dam's becoming operational on October, 25, 1917, "large numbers of salmon annually passed the point where Copco dam is now located" (Ibid.).

Snyder was not shy about extrapolating from the circumstances of his time to what might occur to the river in the future:

> The Klamath River and its principal tributaries are fairly free from obstructions below the large dam at Copco. Projects have appeared in the recent past, which if carried through would have blocked the stream to most of its migrating fish. Others will come in the future, and eventually the anadromous fish may disappear from the river (Ibid. p.50).

In a statement prescient of the failed mitigations that accompanied the construction of the Copco dams and the later Iron Gate Dam, Snyder observed:

> Certain articles have lately appeared in current periodicals which allege that experimental work has conclusively shown that the obstacles presented by high dams to the migration of fish may be easily overcome. These statements are misleading. No method has as yet been devised which will safely provide for the downward migrants…
>
> In the Klamath River a condition prevails that must be constantly kept in mind in any discussion of the relation of dams and fish, namely that the principal migrations occur during low water, and when the water is in greatest demand by the power plant. At this time it will be very difficult to maintain an overflow sufficient for large fishways. The Klamath River has a relatively limited of irrigable land in its basin and consequently the problems attending a conflict between agriculture and the conservation of fisheries may not attract attention there for some time… (Ibid. pp.51-52).

Snyder was understandably unable to fully anticipate the development of agricultural lands in the upper Klamath Basin resulting from the draining of the Klamath wetlands. The loss of this great wetland area and the several major ecological functions played out by the wetlands

has proven to play a major role in the environmental and political controversy accompanying Klamath River management at this time.

The relationship between the ocean fishery and the river fishery is telling in that at the time of Snyder's research there was a widespread belief that river fish did not stray far from the mouth of the river in which they were spawned. In this regard Snyder refers to G.R. Field, manager of the Klamath River Packers Association as "a careful observer and by nature a naturalist. He had implicit confidence in the above presumption and frequently expressed himself as not being disturbed by ocean fishing as long as boats did not operate north of Trinidad" (Ibid. p. 92). In fact the Klamath-spawned fish migrate to feeding areas in Monterey Bay, which is where ocean fishing for salmon originated in California. With a history of success the small fleet of small sailing boats was soon superceded by a fleet of larger, more powerful and far ranging boats which fished northward further and further up the California Coast.

The decline in the Monterey Bay fishery was followed by a decline further north into the Fort Bragg and finally the Eureka region where harvests never again attained the level of the 1925 catch (Ibid. p.99). In 1912 Snyder reports that approximately 141,000 fish weighing an average of 9.8 pounds were processed by the three plants operating at the mouth of the Klamath River. The following statistics are presented to suggest the extent of decline in the fishery from 1915 to 1928. As Snyder indicates, behind these figures are the facts that these diminishing catches were taken by increasing numbers of boats. In 1915 1,232,299 pounds of fish were taken with a maximum of 40 boats where by 1926 811,714 pounds were taken by 126 boats and a correspondingly large increase in fishermen. By 1928 the catch had dropped to 308,826 pounds, still there were those who saw no relationship between the ocean catch and the decline in the river fishery and even maintained that the fishery was expanding! There are telling historic precedents in this willful and cheerful ignoring of the reality of the Klamath fishery (Ibid. p.89).

More complete figures on this decline are as follows:

COMPLETE CATCH IN POUNDS AS REPORTED TO DIVISION OF FISH AND GAME

YEAR	
1915	1,232,229
1916	801,150
1917	265,537
1918	672,345
1919	535,198
1920	872,295
1921	614,247
1922	1,039,580
1923	824,291
1924	814,572
1925	956,082
1926	811,714

1927	408,081
1928	308,826
	(Ibid.)

Snyder relates an early example of innocent promotion of self interests, this time on the part of fishermen who called for an extension of the legal season in response to what seemed to be progressively later runs of fish. In fact "As expressed elsewhere in this paper, it is believed by the writer that this is a phenomena of depletion. Instead of the run appearing later in the season, the fish are becoming less numerous, and as a result the curve representing the migration is being reduced and hence shortened (Ibid.)

The 1999 DOI funded study "Evaluation of Interim Instream Flow Needs in the Klamath River" develops the following analysis of current conditions and historical factors influencing the decline of salmon in the Klamath River Basin.

> **Factors Contributing to the Decline of Anadromous Species**
> The decline of anadromous species within the Klamath River Basin can be attributed to a variety of factors which include both flow and non-flow factors. These include over harvest, affects of land-use practices such as logging, mining, road building, stream habitat alterations, livestock grazing and irrigated agriculture. Other important factors have included climatic change, hood events, droughts, El Nino, fires, changes in water quality and temperature, introduced species, reduced genetic integrity from hatchery production, predation, disease, poaching. Significant effects are also attributed to water allocation practices such construction of dams which blocked substantial areas from upstream migration and have also included flow alterations in the timing, magnitude, duration and frequency of flows in many stream segments on a seasonal basis.
>
> Based on a review of the literature examined for this study, it is reasonable to assume that the Klamath River Basin was primarily in a natural state prior to about 1800. However, by the late 1800s a variety of factors were already contributing to the decline of the anadromous stocks. During this period both accelerated timber harvest, placer gravel suction mining, and commercial exploitation of salmon stocks were underway. Over exploitation of the commercial fisheries (ocean and in river), placer mining, and local dam construction were attributed to declining salmon stocks as early as the 1920s. Snyder (1931) considered the decline of the spring run Chinook to have occurred prior to the closure of the river at Copco in 1917 and attributed this Decline primarily to over exploitation of the salmon stocks and placer gravel suction mining in the Basin.
>
> The concern of over exploitation and declines in the anadromous stocks of the Klamath River Basin led to the closure of commercial fishing in 1933. Prior to the 1990's, excessive ocean harvest rates seriously reduced salmon stock

abundance in the Klamath River System. Passage of the Pacific Fisheries Management Council's Salmon Plan in 1978, followed by the formation of the Klamath River Salmon Management Group in 1985 and the Klamath River and the Klamath Fisheries Management Council in 1987 has led to improved management of Klamath Basin fisheries resources. During the 1980's, ocean harvest rates on age-4 Klamath Fall Chinook averaged 53 percent (PFMC 1991), however since 1991 the average age-4 ocean harvest is less than 12.5 percent (PFMC 1998). This reduction in ocean harvest is partially due to the recognition of river tribal fishing rights, as well as to regulations for conservation of Klamath Basin fall Chinook. Age-4 river harvest rates have also substantially declined since 1990, dropping from an average of 65 percent from 1986-1989 to an average of 32 percent following 1989.

Timber harvest activities within the Klamath River Basin have also contributed to the long-tern decline in the salmon stocks beginning from the turn-of-the-century. This included deterioration of habitat from increased sediment loading and general deterioration of large-scale watershed areas. The extensive placer/grave/suction mining within the Basin resulted in serious habitat. modifications beginning in the early 1900s and directly impacted salmon runs during this period. The extensive habitat modifications to both the main stem and tributary systems are still evident today (e.g., the Scott River).

Although upstream migration of the anadromous stocks were effectively blocked with the construction of Copco Dam in 1917, water allocation practices to meet agricultural demands in the upper Klamath Basin continued to affect downstream anadromous species due to alteration in the shape and magnitude of the hydrograph below Iron Gate Dam. Diversion of water to meet agricultural demands in both the Scott and the Shasta River systems are attributed to significant reductions in habitat availability and quality for spawning and rearing Chinook. Depletion of stream flows in the Scott River and almost every tributary within this subbasin are associated with severe limitations for Coho and steelhead juvenile rearing habitat availability and stranding of juvenile fall Chinook, Coho, and steelhead during the irrigation season in average and below average water years. Diversion of water for agricultural purposes, and the associated agricultural return flows, are attributed to higher than normal water temperatures and degraded water quality in both the Shasta and Scot River systems. Spring run Chinook and spring run steelhead are considered to be extinct or at best remnant populations in the Scott and Shasta rivers and is attributed to poor summer flow conditions. Iron Gate Dam also blocked access to several cool water springs and tributaries below Copco Can that were utilized by spring Chinook such as Jenny and Fall Creeks. These creeks and the main stem Klamath River continued to support Chinook prior to construction of Iron Gate Dam (Kent Bulfinch, pers. Com. Cited by Belchik, per. Com.).

> Although historical data does not exist to determine the temperature and water quality regime of the main stem Klamath River below Klamath Lake, existing flows within the main stem Klamath River below the Scott River during the late summer period have been associated with conditions that can result in lethal combinations of high temperature and low dissolved oxygen and generally concluded that during low flow summer periods the natural conditions in the Klamath main stem are likely marginal for anadromous species due to elevated temperature. However, existence and use of thermal refugia is well documented.
>
> It is evident from the available data that the completion of Copco Dam in 1917 and completion of Trinity Dam in 1962 significantly reduced the Basin wide distribution of anadromous species. However, the construction of dams associated with placer/gravel/suction mining, timber harvest, and fisheries practices impacted anadromous species prior to these major dams. For example, a splash dam constructed on the main stem Klamath River at Klamathanon in 1889 effectively blocked upstream migration of anadromous species to the upper Klamath occurred in the 1930s, many of which were not removed until the 1950s. This included Hopkins, Camp, Indian, Beaver, Dutch and Cottonwood Creeks on the main stem Klamath, and several tributaries in both the Salmon and Scott River basins. Dwinell Dam was completed in 1928 on the upper Shasta River, which effectively blocked upstream migration. No minimum instream flow was required at this facility (pp.10-12).

The Upper Klamath Basin

The construction of Copco Dam beginning in 1910 and completed in 1917 eliminated more than 100 miles of anadromous fish habitat. In addition to this loss of spawning habitat, the construction of Copco and subsequent dams were accompanied by land use practices in the form of greatly increased agricultural draws on available water. This has resulted in increased concentrations of nutrients, both from natural sources such as the famous blue-green algae blooms and runoff from agricultural fields returning to the Klamath River containing significant residues of fertilizers initially applied to the farmlands of the upper Klamath Basin which have grew to critical levels following the post World War II increase in farming of the area.

Downstream of Iron Gate Dam the impacts to anadromous species occurs through a series of factors including the quality of water released from Iron Gate in critical low flow periods. Water quality changes include both those of temperature and the addition of nutriments through Upper Klamath Basin agricultural practices. Other management practices including timber and mining have contributed to increased turbidity.

In addition to changes in water temperature and the timing of water releases, changes in the flow regime of the Klamath River from its natural cycles to the present flow regimes determined by the BOR have resulted in alterations to the very nature of the river. The

disruption of winter freshets which flushed out the season's accumulation of silt have resulted in armoring of the stream bed and sedimentation of the deep holes which had provided the cold water refugia necessary to offset the near lethal temperatures of the summer main stem Klamath River. From the perspective of those interviewed for this study the success of efforts to improve minimum instream flows and the initiation of higher flow events in order to rehabilitate the river channel is highly questionable considering the continued decline of the salmon and the river upon which both the fish and the Karuk depend.

Population Trends in Anadromous Species

The following assessment of the population trends of steelhead, Coho and Chinook salmon within the Klamath Basin is drawn from documents of the National Marine Fisheries Service and the Biological Assessment of the Klamath Project 1997 Operations Plan as presented in the 1999 DOI funded study "Evaluation of Interim Instream Flow Needs in the Klamath River.

Steelhead

Run sizes prior to the 1900s is difficult to ascertain, but were likely to have exceeded up to several million fish. This is based on the descriptions of the salmon runs near the turn of the century provided in Snyder (1938). The best quantitative historical run sizes in the Klamath and Trinity river systems were estimated at 400,000 fish in 1960 (USFWS 1960, cited in Leidy and Leidy 1984), 250,000 in 1967 (Coots 1967), 241,000 in 1972 (Coots 1972) and 135,000 in 1977 (Boydston 1977). Busby et al. (1994) reported that the hatchery influenced summer/fall-run in the Klamath Basin (including the Trinity Riverstocks) during the 1980's numbered approximately 10,000 while the winter-run component of the run was estimated to be approximately 20,000. Monitoring of adult steelhead returns to Iron Gate Hatchery have shown wide variations since monitoring began in 1963. However, estimates during the 1991 through 1995 period have been extremely low and averaged only 166 fish per year compared to an average of 1935 fish per year from 1963 through the 1990 period (Hiser 1994) 11 steelhead returned to Iron Gate Hatchery. NMFS considers that based on available information, Klamath Mountain Province steelhead populations are not self-sustaining and if present trends continue there is a significant probability of endangerment (NMFS 1995a). They are a candidate for listing under the ESA at this time.

Coho

At present, Coho populations are substantially lower than historical population levels evident at the turn of the century and are listed as threatened under the ESA. NMFS estimated that at least 33 populations are at moderate to high risk of extinction at this time. Coho Populations within the Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU),

which includes the Klamath River Basin, are severely depressed and that within the California portion of the ESU, approximately 36 percent of coho streams no longer have spawning runs (NMFS 1995b). Annual spawning escapement to the Klamath River system in 1983 was estimated to range from 15,400 to 20,000 (USFWS 1983, cited in Leidy and Leidy 1984). These estimates, which include hatchery stocks, could be less than 6 percent of their abundance in the 1940's and Populations have experienced at least a 70 percent decline in numbers since the 1960's (CDFG (1994) as cited by Weitkamp et al. 1995). Monitoring of Coho returns at the Iron Gale Hatchery have ranged from 0 fish in 1964 to 2,893 fish in 1987 and are highly variable. Based on limiting monitoring data from the Shasta River, Coho returns have been variable since 1934 and show a great decrease in returns for the past 7 years.

Chinook

The total annual catch and escapement of Klamath River Chinook salmon in the period between 1915 and 1928 was estimated at between 300,000 and 400,000 (Rankel 1978). Coots (1913) estimated that 148,500 chinook entered the Klamath River system in 1972. Between 1978 and 1995 the average annual fall Chinook escapement, including hatchery- produced fish was 58,820 with a low of 18,133 (CDFG 1995). Overall, fall Chinook numbers have declined drastically within the Klamath Basin during this century. As noted previously, spring Chinook runs appear to be in remnant numbers within the Klamath River Basin and have been completely extirpated some of their historically most productive streams, such as the Shasta River (Wales 1951).

Assessment of Interim Flow Needs

As has been referred to previously, the issue of sufficient flows in the Klamath River below Iron Gate Dam, as well as the timing and quantity of water released from Iron Gate Dam is an issue of significance in determining impacts of the dam and its operation by the Bureau of Reclamation on the anadromous fish of the river. The Department of Interior bears trust responsibility to the tribes of the Klamath Basin, including the Karuk, for the restoration and maintenance of aquatic resources, as well as statutory responsibilities including the Endangered Species Act and the Klamath Basin Restoration Act.

The passage in 1968 of the Klamath Basin Restoration Act has resulted in the development of operations plans for the BOR's Klamath Project and the listing and proposed listing of the Klamath River Basin anadromous fish through the Endangered Species act. Since 1962 the release of water from Iron Gate Dam has been the major determinate of flows for the lower Klamath River. In this period PacifiCorp has operated the dam according to the BOR Annual Operating Plans.

The following data was gathered on behalf of the DOI in part to aid the Department's role in developing operation plans for the BOR Klamath Project. Studies by the USGS and Balance

Hydrologics (1996) show that the river has lost some 372,800 ac-feet of water, roughly the estimated consumption for the Klamath Project. This study indicates that in dry years as much as a half million ac-feet are lost to agricultural and related demand. Other effects of the dam, the Klamath Project and BOR water release policies are the seasonal flows that are: "… higher in the late winter and early spring and lower during the summer period compared to expected historical flow Patterns There is also a strong indication that flows are more variable now (see Balance Hydrologics, Inc., 1996)". This is attributed to the use of water agricultural purposes, power generation, and perhaps the effect of lost seasonal low buffering with the loss of storage in Lower Klamath and other Upper Klamath Basin wetlands (Ibid. p.25).

Coincidental with the drafting of this paper concerning the effect of Iron Gate Dam on the cultural and Natural Resources of the Karuk Tribe, a series of studies/ court decisions, and council findings have also focused on the complex of interrelated issues centering on water allocation, fish passage, water quality and the future of salmon in the Klamath Basin. Emerging from this developing body of investigations is a focus which is disentangling the impacts to river health which are a result of past activities including mining, logging, canneries, and unregulated drift net and ocean fishing, from those impacts which are currently originating on the river and in the Upper Klamath Basin. Farmers were encouraged to raise crops in the upper basin with the assurance that through the BOR management strategies there would always be sufficient water for their crops. This was in a time when environmental awareness did not include consideration of the full spectrum of impacts potentially consequential of undertakings such as the Klamath Irrigation Project. Unattended to in this invitation to agricultural development were the consequences to the fish populations of Klamath Lake and the Klamath River. Long before farmers were promised that the basin would provide enough water, the Indian Tribes of the Basin and the River had been promised that there would be enough water to sustain the salmon. This promise exists at the high level of federal Trust responsibilities to the tribes.

In 2003 the Klamath River has fallen from the third most endangered river system in the United States to the second most endangered of the country's river system. The report of American Rivers, a D.C. based conservation group, attributes the declining state of the river to too many irrigation diversions and dams, citing the present runs as constituting less than 10% of historic numbers. This report, like others of the past year cites too much water as having been irresponsibly been promised to too many interests. In this same period a bill has been introduced to Congress which would allocate funds to those participating in water conservation projects.

As is characteristic of species moving into endangered status, it is only at the last stage of threat that the gravity of the situation is attended to by any parties other than those having the most deeply vested interests. In the historic development of recognition of the declining state of the Klamath River fishery, it was the tribes of the region and environmental groups, including fishing organizations, which first addressed the fact of declining runs of salmon. Once the runs reached a sufficient level of devastation other voices became drawn into the dialog. Farmers fearful of the loss of water to their crops, recreationists determined to

continue activities that had become traditional in a few short decades, federal agencies deeply invested in actions such as the Klamath Irrigation Project, and of course, dam owners, have all begun staking out their own claims to the river, often utilizing strategies which keep the focus removed from the central issues of fish health and the perpetuation of Klamath River salmon runs.

In October of 2003 a U.S. Fish and Wildlife Service report ruled that irrigation diversions delayed the salmon migration, allowing the spread of disease leading to the famous die-off of some 30,000 chinook salmon in 2002. In a recent report by the National Research Council, a broad approach to the issue of habitat repair moves beyond simply blaming past activities, fishermen or farmers. This report, recognizing the broad and historic nature of interrelated problems which have culminated in the current situation, calls for removal of dams, including Iron Gate, wetland restoration, increased control of conditions along feeder streams and reducing hatchery production so that wild salmon populations will have an increased opportunity to reinhabit their ecological niche in the Klamath River. The panel responsible for this report calls for wildlife regulators to make use of the U.S. Endangered Species act to do what is necessary to lead to recovery of the Klamath fishery.

The conclusions of this report as to the dire status of the fishery, as well as the complex set of environmental, regulatory and economic issues involved, closely resembles the assessments of the Karuk people and water quality experts interviewed for this paper and referred to as historic and scientific bodies of information. The fish which were once plentiful beyond any sense of potential depletion, are now almost extinct and will certainly be so in the near future unless a real examination of the situation and decisive acts replace the political and economic argumentation characteristic of the past few decades.

Summary and Conclusions

This White Paper on behalf of the Karuk Tribe began with a discussion of the longevity and texture of the finely tuned cultural and technological adaptations of the Karuk people to their natural environment. Indeed, there can be no doubt that the resources of the Klamath Basin, and most profoundly the Klamath River have shaped the culture of the descendents of those Paleo-Indian pioneers who first entered the homeland the Karuk people of today. This conclusion is a consequence of linguistic studies, archaeological investigations, ethnographic reports and the words of Karuk individuals speaking in their own voices and voicing their closest concerns for their survival as a culturally intact people. A closely related conclusion is that today, as much as in past millennia, the fortunes and future of the Karuk are inextricably linked to and delimited by the health and vitality of the Klamath River.

While the individuals interviewed for this project were initially given an extensive listing of possible concerns and issues to serve as a context for discussion, in fact there emerged from the interview process a focus that was relatively narrow in relation to the range of potential issues offered for discussion. The core issues of water quality and fish passage proved in every discussion to be the focus of a dense and complex set of subsuming issues including the effect of these core issues upon ceremonies and basketry, two central elements in Karuk cultural life. There was a general awareness that the decline in the Klamath River salmon fishery is a process that has been developing for a hundred years or more and which in its earlier manifestations preceded the construction of Iron Gate and the other dams currently present in the upper K1amath Basin.

A profound unity emerged from the concerns of Karuk individuals with these core elements of water quality and fish at two levels. First, these were issues that concerned every person interviewed. Secondly, there was a remarkable consistency between these Native concerns, spoken to in an idiomatic language of close, and passionate fair-mindedness, and those of the technical experts addressing the state of the Klamath Basin from the perspectives of biologists, geomorphologists and other professionals examining the same range of issues.

General agreement exists as to the richness of the Klamath fishery prior to contact with Europeans in the mid-Nineteenth Century. The decline in this fishery, long-term and now precipitous, is as well unarguable. What is at issue is the role of Iron Gate Dam as the largest and most recent obstacle to fish passage and the role of this dam in the complex development and consequences of the Klamath Project. The developments within the Upper Klamath Basin which bear upon the cultural and natural resources of the Karuk, as well as the other Klamath River tribes, include the post World War II expansion of the Klamath Project by the Bureau of Reclamation. This expansion required destruction of the formerly extensive Upper Klamath Basin wetlands. The loss of wetlands converted to irrigated agricultural lands has had the consequence of eliminating what had been a natural storage system releasing water gradually into the river system.

While the impacts to the Klamath River and its anadromous fish populations are many and began with the arrival of the first Europeans in the Klamath Basin, the subject of this paper

has been that of the effect of Iron Gate Dam. As complex as the issues are, it is nevertheless possible to disentangle the effects of this dam from the other sources of impact, both historical and current by paying close attention to the information now available on this subject. Iron Gate Dam, in the sense of its simple presence, blocks anadromous passage and has played a role in the loss of wetlands which played a crucial role in maintaining the health of the river system. Federal policy executed by the BOR has, not for the first time in the western United States, promoted an expansion into areas that were at one time seen as underutilized and "reclaimable" without real consideration of the environmental consequences. The presence of the dams linked with water release policies determined by political and economic considerations, and not primarily by concern for river health and fish passage, have in the past 50 years come close to exterminating the remaining salmon runs of the Klamath River.

The process of applying for relicensing of Iron Gate Dam requires examination of many alternatives to present dam management. These considerations rightly include mitigations, alterations of management and dam removal. Among the Karuk interviewed for this paper there was little or no confidence that any rectifications short of dam removal would only delay the extinction of the Klamath River salmon fishery.

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