March 15, 2002

RESPONSE TO ISRP COMMENTS

COLUMBIA CASCADE PROVINCE – OKANOGAN RIVER

PROJECTS #29040 #29042 #29050 #29051

PROJECT #29040: DEVELOP AND PROPAGATE LOCAL OKANOGAN RIVER SUMMER/FALL CHINOOK

1. "…with the objective of utilizing what is claimed to be under-seeded habitat."

Historical observations and spawning ground surveys documented Chinook use in the entire Okanogan River from Lake Osoyoos downstream to the Columbia River. Fulton reported Chinook spawning on "intermittent riffles throughout its (Okanogan) length, and lower 2 km. of Similkameen River." Bryant and Parkhurst (1950) reported, "The chief Chinook spawning areas are located in the lower 16 miles, up to the town of Malott, and for a distance of a few miles downstream from Lake Osoyoos." French and Wahle (1965) mapped Chinook spawning locations over a seven-year period. Their mapping shows Chinook redds from the mouth of the Okanogan upstream to the Oliver diversion located below Lake Vaseaux. Chinook redds were concentrated at the confluence of the Similkameen River, between Tonasket and Riverside, and between Omak and Okanogan.

More recent Chinook spawning surveys demonstrated substantially reduced use of historical habitat. In 1990, Langness documented less than 200 redds in the Okanogan subbasin, with none observed in the Okanogan River between Riverside and Omak, and below Malott. Only one carcass was collected from the lower Okanogan River. From 1960 through 1990, summer/fall Chinook redd counts on the Okanogan River varied from 9 in 1963 to 656 in 1970. Average annual redd counts were 141 in the 1960s, 242 in the 1970s, 125 in the 1980s, and 150 from 1990 to 1997.

By the 1997 spawning survey, Miller et al. (1998) found few redds downstream from Malott and between Omak and Riverside. Miller also suggested that, "…spawning areas infrequently used when numbers of spawners are low are more often at higher spawning densities. Green's indices, which are based on rivermile, also show that the distribution of redds can become less clumped at higher redd numbers." Miller further showed that Chinook escapements in the Okanogan had not changed significantly while in the Similkameen an increasing trend was significant as a likely result of the artificial propagation program initiated at Similkameen Pond with the 1989 brood year.

Historically, Chinook spawning in the Columbia River in the vicinity of the confluence of the Okanogan River was substantial. In 1966, 903 redds were counted from Wells Dam upstream to Chief Joseph Dam. Most of these redds, 848, were counted from just below the confluence of the Okanogan River upstream to Washburn Island (Meekin 1967). Miller (1998) stated, "We believe that some Chinook spawn downstream from Chief Joseph Dam in the Columbia River." "For example, L. Stuehrenberg (personal comm.) last found radio-tagged fish on a gravel bar near Bridgeport, which he believes is a spawning area."

Most recently, spawning of summer/fall Chinook has concentrated near the Similkameen Pond where 576,000 yearling smolts are released annually. Late-arriving summer/fall Chinook that historically would have spawned in the lower, mainstem Okanogan River and Columbia River have not been propagated as evidenced by the August 28th endpoint for broodstock collection at Wells Dam.

In the past two years, however, returns of summer Chinook to the Similkameen River and upper Okanogan have increased substantially. High smolt-to-adult survival of the hatchery fish from the Similkameen Pond has produced an extremely high spawner density in the Similkameen River (>400 redds/km). Unfortunately, this has not produced the expected increase in natural-origin fish (local carrying capacity exceeded). Of the returning adult hatchery fish between 1995-2000, 78% of the fish spawned in the Similkameen River. Of the hatchery fish that spawn in the Okanogan River, 76% spawn above Riverside (rkm 65). Thus, a large portion of the historical Okanogan River spawning habitat is underutilized. This has led to consideration of the need for additional acclimation sites to disperse the returning adults to underutilized habitat. (H. Bartlett, per. comm. 2001)

From the above information, the Colville Tribes believe that historical, and still available, spawning habitat is underutilized and should be returned to production. With the higher juvenile and adult mortalities associated with passing 9 mainstem dams, we must make the tributary habitat more productive to restore Chinook populations. Unless society makes a different decision about the operation of the 9 dams, low survival rates must be countered with supplementation of all available spawning habitat.

2. "…there is no discussion of the possibility that fish could be reared elsewhere and released at a number of points downstream of the Similkameen facility."

The Colville Tribes and Washington Department of Fish and Wildlife have proposed a number of new acclimation sites downstream from the confluence of the Similkameen River for a number of reasons. First, the over-winter rearing program at Similkameen Pond has demonstrated success (smolt-adult survival) in the upper Columbia River. SARs for the brood years 1994 and 1995 (poor survival years generally for Columbia Basin salmon) were 0.7% and 0.4%, respectively (H. Bartlett, per. comm. 2002)

Second, the Similkameen program has demonstrated a significant affinity of returning Chinook to spawn in the area of acclimation. Redd densities are now exceeding 400/km in the lower Similkameen River while more distant habitat in the mid to lower Okanogan River goes underused. Spawning ground surveys are demonstrating a substantial clumping of redds in the vicinity of the acclimation facility. This result is consistent with the findings of the U.S. Fish and Wildlife Service's evaluation of fall Chinook supplementation in the Snake River basin (Garcia 2002). There, the Service has evaluated three acclimation sites where yearling Chinook are released. The evaluation objective was "… to determine where juveniles released at each acclimation facility migrate and spawn as returning adults, and whether or not the fish distribute throughout the areas normally used by fall Chinook salmon." Using radio tags, the researchers have estimated that 86% of the fish released in the upper Snake River (Pittsburg Landing Facility) spawned therein, 71% of the fish released in the lower Snake River (Captain John Facility) spawned therein, and 80% of the fish released in the Clearwater River (Big Canyon Facility) spawned therein. The evaluation has also shown that redd distribution has changed since supplementation began with a higher percentage of spawning in the supplemented areas.

Thirdly, the acclimation ponds proposed by the Colville Tribes are comparatively inexpensive to operate, with no construction costs, and little start-up costs. These ponds offer the above benefits of acclimation and rearing costs that likely could not be matched at other locales. The Colville Tribes are currently rearing 300,000 spring Chinook from fingerling to yearling smolts (5-6 months) in an irrigation settling pond for a total start-up and O&M cost of $120,000. The Chinook program needs facilities to raise the fish from fingerlings to yearling smolts. The proposed irrigation ponds offer that capacity at minimal costs.

Finally, trucking and directly releasing the fish into the river reduces survival, as fish are placed into a new and substantially different environment in an already stressed condition from being transported.

The Scientific Review Team (1999) recommended that, "In developing hatchery technology, hatchery programs should work toward the goal of providing environments that resemble natural conditions during artificial propagation. These may include: …Acclimation ponds at release sites;…" As a conservation recommendation in its 1999 Biological Opinion on Artificial Propagation in the Columbia River Basin, NMFS stated, "The use of acclimation facilities and volitional release strategies should be considered to reduce potential straying and minimize potential competition between hatchery fish and listed salmon and steelhead."

3. "Justification needs to be given that developing a local broodstock is necessary. What can be gained with this approach? Why not continue to use the current broodstock?"

The current broodstock for the Okanogan River is collected at Wells Dam. The broodstock is therefore a mixture of fish originating from the Okanogan and Methow

basins. The habitat of the Okanogan River, however, is substantially different than that of the Methow. Unlike the Methow, the Okanogan system was shaped by glaciation, creating a wide valley and a low-gradient (0.03%-0.04%), more sinuous river, with a different substrate base. The Okanogan River also arises from a series of chain lakes that provide distinct habitats to which anadromous fish species evolved. An examination of some physical/chemical characteristics of the Methow and Okanogan subbasins also demonstrates substantial differences (Spotts 1989):

1970-1980	Methow R. (Twisp)	Methow R. (Pateros)	Okanogan R. (Oroville)	Okanogan R. (Malott)
Mean Temp.	43.14	47.21	52.10	49.87
Max. Temp.	59.00	68.36	78.80	81.32
Min. Temp.	32.00	0.00 ?	33.08	0.00 ?
Mean Specific Conductivity	124.59	149.24	267.81	221.49

Given the different habitats found in the Okanogan, biologists have observed diversity in fish populations: “Fall Chinook spawn in the lower reaches of the Methow and Okanogan rivers as might be expected; however, fall Chinook also spawn in the Okanogan River between the towns of Ellisforde and Tonasket. This unusual late spawning at the upper end of the Okanogan index area, suggests that a unique subpopulation of summer or fall Chinook may exist.” (Langness 1991).

The Scientific Review Team (1999) emphasizes the importance of operating artificial propagation programs consistent with local stock structure. Their report states, “Development and adherence to strict genetic guidelines and breeding protocols consistent with local population structure is essential for effective hatchery contribution to wild production and maintenance of local genetic diversity.” Given the lack of propagation for late-arriving summer/fall Chinook and swamping with summer Chinook collected from Wells Dam, the uniqueness of the returning Chinook is likely not known. However, given the uniqueness of the Okanogan habitat and a localized brood stock program, the genetic structure of the population could change within a few generations as discussed in Lichatowich (1998), enhancing the diversity and productivity of the upper Columbia River summer/fall Chinook ESU.

4. "Justification should be provided on the need for this level of intervention?"

The level of intervention is incremental and based on several management objectives. First, the late-arriving summer/fall Chinook, those passing Wells Dam after August 28th have not been integrated into the summer Chinook broodstock. A review of the cumulative run counts shows that 22% of the summer/fall Chinook pass Wells Dam after the end of broodstock collection. Therefore, the fall Chinook component of the ESU has not been propagated and supplemented in the upper Columbia portion of the Columbia Cascade Province. With the attendant mortalities associated with passing 9 dams on both the downstream and upstream migration, this portion of the ESU is suffering serious decline. The decline in late-arriving fish is evidenced by the significant reduction in spawning found in the lower Okanogan River, an area that once significant concentrations of Chinook redds (see Bryant and Parkhurst 1950).

The objective for propagating these late-arriving fish is to make full use of available habitat. The program will need to be sized to ensure sufficient supplementation of the remaining natural-origin fish, given the excessive mainstem passage mortalities. The initial size of this program will be determined in the development of the Okanogan Summer/Fall Chinook Hatchery & Genetic Management Plan (HGMP) currently being prepared. The program would then be adjusted based on program targets for abundance and hatchery-origin/natural-origin population mix. The program will be also monitored and adjusted for effects on other spawning groups within the ESU and other performance standards included in the final HGMP.

Other project objectives focus on redistributing existing summer Chinook production to make better use of historical habitat. One objective splits the 576,000 yearling smolt production from Similkameen Pond to one other downriver site, closer to historical, underused habitat. The intent of this action is to increase natural production of summer Chinook. A related objective would transfer summer chinook production currently being released into the mainstem Columbia River to the Okanogan River, consistent with the Mid-Columbia Habitat Conservation Plan. This objective is also focused on fully utilizing available habitat.

Finally, but not unimportantly, the proposed project includes an objective of increasing production of hatchery-origin fish to provide opportunity for the Colville Tribes to pursue their ceremonial and subsistence fisheries, and recreational anglers to harvest hatchery-origin fish, selectively, compatible with recovering a fully-distributed, natural-origin population. Again the size of this component of the program will be calculated through development of the HGMP. The size of this portion of the hatchery program will be initially based on achieving a reasonable, yet conservative tribal and recreational harvest consistent with potential effects on the carrying capacity of the riverine habitat. The initial size of this program's component will also be based on the expectation for harvestable surplus from the other program activities discussed above. This production is fully justified by the longstanding abrogation by the Federal government in protecting the fish resources of the Confederated Colville Tribes. This trust responsibility is seriously

in arrears as evidenced by the minimal remaining C&S fishing opportunity available to these tribes and lack of hatchery or habitat mitigation in their home waters.

5. "Justification also needs to be given for the acclimation facility. Direct plants from trucks may be just as effective or more so."

Please refer to the response to question #2.

6. "Explain the relationship of this to the PUD HCP, if any"

The framework for the artificial production program in the Habitat Conservation Plans for Wells, Rocky Reach, and Rock Island Hydroelectric Projects is described in a Biological Assessment and Management Plan (BAMP) (Bugert 1998). The BAMP provides the following guidance for summer Chinook in the Okanogan:

Page 59: "The current production of summer chinook salmon in the Okanogan River is 576,000 marked yearling smolts (57,600 lbs. at 10 fpp) released from the Similkameen Acclimation Pond (a part of the Rock Island Hatchery Complex)."

Since the BAMP was written, survival rates of summer Chinook have improved creating excessive spawning densities near the acclimation pond. Concurrently, spawning density elsewhere in the Okanogan River is significantly less than that near the pond. This irregular distribution of spawning led to this proposal including new acclimation facilities to spread the adult fish and make better use of historical spawning habitat.

Page 59: "Efforts will be made to collect local broodstock on the Okanogan River, yet the program will still rely upon marked and unmarked broodstock intercepted at Wells Dam until a successful trap is developed on the Okanogan River. If additional production is required, an acclimation pond could be built near the confluence of Whitestone Creek. Likewise, releases would be shifted from mainstem hatcheries to such an acclimation pond."

This proposal, #29040; proposal #29042, Selective Fish Collection and Harvesting Gear; and proposal #29008, Adult Passage Counting and Trapping at Zosel Dam, all include tasks to investigate means of collecting broodstock from the Okanogan River.

Rather than develop a new site for acclimation near Whitestone Creek, use of existing irrigation settling ponds offer a more cost-effective option for rearing and acclimating Chinook. Two, available ponds are located immediately downstream from Whitestone Creek near the town of Tonasket. Additional acclimation sites for the summer Chinook production released at the mainstem hatcheries would be investigated. These include ponds at the town of Omak and the Chiliwist Creek site proposed by WDFW.

Page 59: "In Phase B, production of 1,620,000 subyearling summer Chinook salmon at Rocky Reach FH would be changed to 400,000 marked yearling summer Chinook for acclimation and release from a facility (preferably near Whitestone Creek confluence) on the Okanogan River." "Both these changes are contingent upon procurement of adequate land and water rights for these locations."

With the availability of irrigation settling ponds to rear and acclimate summer Chinook, the shift of production releases from Rocky Reach FH to the Okanogan River can and should proceed earlier and more cost effectively. The procurement of land, construction of facilities, and receipt of water rights are not necessary under the current proposal.

Pages 59-60: "The part of the summer/fall Chinook salmon run that passes Wells Dam after August 28 is currently not being artificially propagated. The HWG felt that this part of the run is genetically similar to those that pass Wells Dam in July and August (or the hatchery volunteers for that matter), but this component should be propagated to ensure that the entire run is equally enhanced. This may protect against selective pressures in artificial propagation. A feasible approach would be to collect some of these fish for propagation and release into the mainstem Columbia River (volunteers to Wells FH could also be used). An acclimation pond would be built at the right bank of the Chief Joseph Dam tailrace, where suitable water is available. This pond would release 300,000 marked yearling smolts (30,000 lbs. at 10 fpp)."

As recommended above, this proposal includes the propagation of the later-arriving summer/fall Chinook for release in the Columbia River. However, as later-arriving Chinook also spawned in considerable numbers in the lower Okanogan River and this habitat is largely unused, the current proposal also includes acclimating these fish at sites in the lower Okanogan River. The proposed Chiliwist Creek site or ponds at the town of Omak could be used for this purpose.

The hatchery site located below Chief Joseph Dam is being investigated in development of the summer/fall and spring chinook HGMPs for its potential as an acclimation site. Additionally, the capacity of the site for hatching and rearing of Chinook salmon is being reviewed.

From a reading of the above BAMP passages, it is evident that proposal #29040 is based on the guidance from the HCP process. In large part, the current proposal has improved substantially upon the cost effectiveness of the BAMP.

REFERENCES:

Bryant and Parkhurst, "Survey of the Columbia River and its Tributaries, Part IV"; Special Science Report, Fisheries No. 37

Bugert, Bob, "Biological Assessment and Management Plan: Mid-Columbia River Hatchery Program", April 1998

French, R. and Wahle, R, "Salmon Escapements above Rock Island Dam, 1954-60", March 1965; USFWS Special Scientific Report – Fisheries No. 493

Fulton, Leonard A., "Spawning Areas and Abundance of Chinook Salmon (Onchorhynchus tshawytscha) in the Columbia River Basin – Past and Present"

Garcia, Aaron P., "Spawning Distribution of Snake River Fall Chinook Salmon", 2002 BPA project proposal No. 199801003

Langness, Olaf P., "Summer Chinook Salmon Spawning Ground Surveys of the Methow and Okanogan River Basins in 1990", February 1991.

Meekin, Thomas K., "Observations of Exposed Fall Chinook Redds Below Chief Joseph Dam During Periods of Low Flow: October 1966 through January 1967"; State of Washington Department of Fisheries, Research Division.

Miller, M. D. et al., "Summer/Fall Chinook Salmon Spawning Ground Survey in the Methow and Okanogan River Basins, 1997", June 1998; Chelan County PUD

NMFS, "Biological Opinion on Artificial Propagation in the Columbia River Basin", March 29, 1999

Scientific Review Team, "Review of Artificial Production of Anadromous and Resident Fish in the Columbia River Basin: A Scientific Basis for Columbia River Production Programs", April 1999; Northwest Power Planning Council Document 99-4

PROJECT #29042: SELECTIVE FISH COLLECTION AND HARVESTING GEAR

1. "…without a detailed research plan, we do not have an adequate basis for judging the scientific merits of the proposal."

The full effect of the Northwest Power Act's fishery mitigation provisions and the Endangered Species Act species' recovery provisions has not been realized in the Columbia Cascade Province despite the presence of two endangered species, seriously unmet tribal trust responsibilities, and very limited recreational angling. Consequently, the Colville Tribes have not had the opportunity and financing to establish sufficient infrastructure, as has occurred with state, tribal, and Federal fishery co-managers downriver, to fully respond to project solicitations with detailed plans.

The Colville Tribes have proposed a conceptual plan for testing and deploying selective fishing gear as deemed critical by the National Marine Fisheries Service. Developing a detailed research plan is a necessary, early task in the Tribes' proposal. Once drafted, the

Tribes would seek scientific review by NMFS and others to ensure its merits. Such review is included in the proposal. The Tribes would gladly include the ISRP in that review process and condition funding of tasks to an acceptable review outcome.

2. **"There needs to be discussion of a proposed location for the test fishery that would satisfy the requirements of the recovery plans for listed species."**

The location of the test fisheries will be clearly delineated in the detailed research plan. The Tribes anticipate conducting the test fisheries at two primary locations, from Chief Joseph Dam downstream to the confluence of the Okanogan River and at sites in the Okanogan River upstream to Zosel Dam.

The detailed research plan will need to undergo review by NMFS pursuant to the ESA. The plan will therefore need to be structured and implemented within constraints for protection of ESA-listed species.

At the above locations, there should be little risk to endangered Upper Columbia River Spring-Run Chinook Salmon destined for the Methow River as these fish will be homing to the Methow River, many miles downstream from the proposed test fisheries. Also, none of the Methow spring Chinook have been recorded as harvested in the Tribes' fishery in the Chief Joseph Dam Tailrace Fishery. Listed Upper Columbia River Steelhead will be subject to test fisheries and these fish will need to be carefully protected by the design and conduct of the research. However, most of the steelhead destined for the Okanogan River are of hatchery origin, having been reared at Wells Hatchery. Recently with the large runs of these hatchery-origin fish, NMFS has encouraged their harvest in selective recreational fisheries to reduce their numbers spawning in the wild.

3. **"There should be a discussion of data available on survival rates of salmonids taken in the proposed gear."**

The detailed research plan will describe the actual gear types to be tested, their likely effectiveness, and effects on target and non-target species in the situations to be fished in the Okanogan and Columbia rivers. At this time, the Tribes anticipate testing floating net traps, fish wheels, tangle nets, beach seines, a trap at Zosel Dam (proposal #29008), and hook-and-line gear.

The following results from tangle net experiments:

In Project 20098, Develop and Evaluate Selective Commercial Fishing Gear: Tangle Nets, author Geraldine Vander Haegen reported: "In an ongoing study, Fraser River fishers have had encouraging results live-releasing salmonids of all species from a tangle net. The evaluation of the survival of these fish to spawning is still in progress, but the initial results are promising. More than 87% of all species were live released, and most of the dead fish were killed by seals (Parfitt, 1998)."

Studies in Budd Inlet, Washington showed that 76% of the Chinook captured in tangle nets and released were in a "lively, not bleeding" condition, whereas 19% were captured dead. In experiments on the Willipa River, Washington, 89% of Chinook and 79% of coho captured in tangle nets were released in a "lively, not bleeding" condition, whereas 8% of the Chinook and 20% of the coho were captured dead (Vander Haegen 2001).

Tangle net studies in the lower Columbia River that targeted spring Chinook demonstrated 13.3% immediate and long-term mortality with a 3 ½" single-wall tangle net. With the larger 4 ½" single-wall net, a 2.6% immediate mortality was observed, but a long-term mortality rate was not reported. In a subsequent commercial, test fishery, ODFW (2002) reported immediate mortalities of 1% for 3 ½" tangle nets, 5% for 4 ½" nets, and 8% for 5"-6" tangle nets.

The following information was obtained from a summary of selective fishing gear and methods prepared by Fisheries and Oceans Canada (2000):

Floating Net Traps:

The summaries of 25 experiments were reported on a variety of trap types and configurations. Mortalities were usually 0-1 fish. Results of different studies were summarized as: "The trap is very successful for live handling of fish"; "Condition of fish caught was good. Handling stress was limited"; "All fish were released in the same condition as capture"; "A number of other species were also caught. All fish were released in the same condition in which they were captured"; "As a method of harvesting selectively, the trap showed great promise especially in areas where weak stocks require selective fishing"; "0 mortality of all catch indicated it is possible to selectively harvest target species while releasing non-target species in perfect condition"; and "A floating trap was effective of capturing and releasing any species of salmon with minimal stress".

Fish Wheels:

The summaries of six experiments using various fish wheel designs indicated little, if any, injury or mortality to captured salmon. In the most extensive study, a Yale fish wheel captured 26,026 salmon of which 97% were in #1 vigorous condition. "Nearly all of the #2 and #4 (bleeding) fish were wounded by seals and not the gear." In another study, a power assisted wheel was used that was, "… effective at capturing and releasing any species of salmon without any or with only very minimal stress."

Beach Seines:

The summary of seven experiments indicated that little if any short-term mortality occurred to salmon from the use of beach seines. In one experiment, 1,504 chum salmon were released "in excellent condition". In another, 34 chum and 2 coho were released "in good condition. However, in two experiments the authors reported that "many fish were released in a lethargic state" (though no net mortalities occurred) and that "most non-

target species were released in good condition with very little resuscitation required." One study recommended that short-term survival of fish caught in beach seines needs further investigation.

4. "Are sufficient data already available from studies elsewhere?"

The results from other selective gear experiments, while instructive in designing, planning, and conducting research in the Columbia Cascade Province, are not sufficiently applicable to conditions and species in the Columbia and Okanogan rivers. Experience has shown that the fishing location, water conditions, fish species, fishers' experience, specific gear, and fishing methods all significantly affect the capture rate and effect of selective gear. In reviewing the summary of selective gear experiments prepared by Fisheries and Oceans Canada, it is readily apparent that this type of research requires considerable training of personnel, adapting of gear, and preparing of individual fishing sites before suitable tests can actually be performed. Much of the data are site and species specific, and variable to changing water conditions. To assess the feasibility of selective gears to the river and reservoir conditions applicable to Colville Tribal waters will require site-specific experimentation.

The selective fishing information must be gathered in the Columbia Cascade Province from which the Colville Tribes can determine the efficacy of the gear in achieving their ceremonial and subsistence fishery needs while protecting weak provincial stocks. NMFS will require specific information to assess the effects of selective fishing gear on ESA-listed species. Critical information needs to be obtained on catch rates (by species), catch-per-unit-effort, cost, immediate mortality and injury rates, long-term mortality rates, and proportion of hatchery-origin fish. Research also needs to be performed in the area to determine the ability of selective gears to cost-effectively collect local broodstock and adult fish for RM&E purposes.

REFERENCES:

Fisheries & Oceans Canada, "Technical Evaluation of Selective Fishing Gear and Methods, 1995-2000", August 2000; from website: www-comm.pac.dfo-mpo.gc.ca/English/selective/interim-report/default.htm

ODFW, "Joint Staff Report – Winter Fact Sheet No. 2", January 31, 2002; Columbia River Compact

Vander Haegen, Geraldine, "Evaluate Tangle Nets for Selective Fishing, Semi-Annual Progress Report", February 1, 2001

Vander Haegen, Geraldine, "Proposal #20098: Develop and Evaluate Selective Commercial Fishing Gear: Tangle Nets", 1999

PROJECT #29050: PHASE I OKANOGAN RIVER SPRING CHINOOK PRODUCTION

1. **"The proposal does not contain sufficient detail to allow scientific review of tasks and methods."**

The detail of the Phase I Spring Chinook Production Program is currently being developed in the Hatchery & Genetic Management Plan (HGMP), Objective 1 of the proposal. This plan will be available by June 2002, for scientific review of tasks and methods. The plan should be in final form later in the year. In addition to the details of the propagation program, the HGMP will include comprehensive monitoring and evaluation of the spring Chinook within the hatchery and acclimation facilities, and throughout their life cycle in the Okanogan and Columbia rivers.

2. **"There is a need for justification of the focus on spring Chinook, when spring Chinook apparently were never abundant in the area."**

Spring Chinook were extirpated long ago from the Okanogan sub-basin due to degradation of tributary and mainstem Okanogan River habitat, hydroelectric development, and over-fishing on the Columbia River. Therefore, critical information on the viability and likely performance of spring Chinook in the Okanogan does not exist.

A common presumption amongst many biologists is that the Okanogan River was never an abundant producer of spring Chinook. This presumption appears to be supported by assessments of the limited spawning and rearing habitat in tributaries of the Okanogan River. These tributaries and the mainstem Okanogan River do not provide the classic habitat suitable for producing yearling smolts, as does the Wenatchee, Entiat, and Methow rivers also within the Columbia Cascade Province. The summer and fall water temperatures of the low-gradient Okanogan River are excessive compared to the snow-fed, rivers originating in the Cascade Mountains. The presumption is further supported by the complete lack of spring Chinook in the Okanogan River since modern fisheries biology began after WWII.

However, in a review of tribal salmon fisheries (Ray 1972) wrote, "Alexander Ross, describing the Southern Okanogan as of 1811, wrote that in June the tribe all assemble again in large bands on the banks of the different rivers for the purpose of fishing the summer season." "Specifically, among the Sanpoil and Nespelem tribes, the summer fishing season began about the first of May, when sturgeon and small fish were available. Trout and salmon appeared soon afterwards…. the salmon season was initiated with a ceremony, the first salmon rite." It appears that tribes gathered on the Okanogan River in June to fish when opportunities also existed at the larger fishery at Kettle Falls on the Columbia River. This behavior may indicate that a spring run salmon was being sought and that they were in sufficient numbers to warrant attracting Southern Okanogans.

The Okanogan River flows through a wide, glaciated valley that has been a natural passageway through the mountains for thousands of years. This passageway was important to early European exploration, mining, and settlement. Because of early settlement, "surface waters were over-appropriated in the early 1900s, with resulting loss of spawning and rearing for Chinook in the Chiliwist, Loup Loup, Bonaparte, and Salmon creeks, with the loss of the latter termed 'particularly devastating' (WDW et al. 1989)" (Chapman et al.1995). Chapman continues, "The significance of loss of the first three streams is doubtful, as no record is available that spring Chinook ever used those streams (see Craig and Suomela 1941). If any Chinook used them, we would expect the fish to have been spring Chinook, rather than summer/fall Chinook. Omak Creek, according to Fulton (1968) was lost to spring Chinook as a result of irrigation withdrawals. However, none of the sources cited for his conclusions (WDF 1938; French and Wahle 1960, 1965; and Fish and Hanavan 1948) supports him, although Bryant and Parkhurst (1950) mention limited use of Omak Creek by spring Chinook."

Peak migration of upper Columbia River spring Chinook into tributary streams occurs in late May and June, with greater than 50 percent of the run passing Wells Dam by May 30th. From 1978-1982, 99 percent of the spring Chinook run had passed Wells Dam by June 20th (ODFW 1984). Alternatively, summer Chinook for the same years passed Wells Dam in July and August, with less than 10 percent of the run passing by July 5th with the peak of the run passing on July 28th.

From 1954 to 1960, French and Wahle (1965) documented Chinook spawning in the Okanogan River upstream of Lake Osoyoos. Langness (1991) stated, "However, these fish (Chinook) are occasionally found up on the sockeye spawning grounds (Mario George, Tribal Researcher, Osoyoos Indian Band, personal communication, 1990); for example during the 1990 sockeye spawning survey, one live Chinook was sighted (Larrie Lavoy, Fish Biologist, WDF Wenatchee, personal communication, 1990)."

Chapman (1995) reported that, "In 1936, spring Chinook were observed in the Okanogan River upstream from Lake Osoyoos by Canadian biologists (Gartrell 1936). That observation for May estimated 100-300 adults present on the spawning grounds." In recent years, Chinook have been reported in small numbers spawning in the Okanogan River above Lake Osoyoos (Bartlett, per. comm. 2001)

In reviewing the history of the Deschutes River, Oregon, Lichatowich (1998) noted that spring chinook habitat was seriously degraded by irrigated agriculture and cattle grazing for almost 40 years prior to the first fish surveys. Some of the Deschutes tributaries were naturally warmer than others allowing faster growth of juveniles that "… could have produced a spring Chinook population largely composed of the ocean-type life history." "In wild Chinook salmon populations, the propensity to migrate during their first year (ocean type) or in the spring of their second year (stream type) is a function of growth opportunity, which is determined by photoperiod at emergence and normal stream temperature (Taylor 1991)." "In streams flowing through arid areas of the Cascade rain shadow, such as the Crooked River, warm water for rearing and early emergence could have provided sufficient growth opportunity to produce the ocean type life history in

spring Chinook. In Oregon, the highly productive spring Chinook population in the Rogue River is largely ocean type fish (90%) (Cramer and McPherson 1981)."

Lichatowich further states that the substantial decline of spring and summer Chinook in the Yakima River was attributed to mortality at irrigation diversions and to elevated water temperatures in the lower river that eliminated the more productive ocean-type life history. Similarly, the ocean-type spring Chinook were eliminated near the end of the 19th century in the Umatilla River.

The historical information from the Okanogan River in the U.S. and Canada will continue to be accumulated and assessed to reconstruct the likely life-history diversity of spring Chinook. From the information of early European explorers, it appears that the river supported sufficient spring Chinook to attract tribes to fishing camps in May, June, and July. From the habitat base, it is likely that the productivity of spring Chinook in the Okanogan was created by a variety of life history types. These types could have included a stream-type, yearling smolt; a sub-yearling smolt; a sub-yearling emigrant that finished its rearing in the Columbia River prior to ocean entry in the following spring; and smolts that emigrated from Osoyoos Lake. This later life-history type could have been highly productive as it is for sockeye and coho salmon.

3. "There is an acclimation issue here, i.e. spring Chinook may not be suited to the temperature regime and other factors present in the Okanogan River."

High water temperatures in the Okanogan River are widely recognized. "Thermal pollution resulting from tributary irrigation return flows, over-appropriated streamflows and physical characteristics of the Okanogan River channel create a thermal barrier to migrating adult fish in the late summer and early fall. High summer-fall water temperatures throughout the basin also severely limit the amount of rearing habitat available for juvenile salmonids (Spotts 1989). Fulton, in his survey of chinook spawning, reported that the Okanogan "main stream has high summer temperatures that limit use of stream."

As indicated in issue #2 above, the Okanogan River was historically a warmer river and the spring Chinook likely used various life history strategies to take advantage of its productive waters. For the proposed Phase I production program, the propagation plan will avoid the periods of high river temperatures. Spring Chinook fingerlings will be transported to the Ellisforde acclimation pond in October or November following the normal, Fall decline in river temperatures. After over-winter rearing, the smolts will be released in March or early April and should immediately emigrate from the Okanogan River well before the July to September period of high water temperatures.

Adult spring Chinook should arrive back in the Okanogan River in late May and June during the normal spring freshet and be available for harvest into July. Chinook remaining in the mainstem Okanogan River could be exposed to excessive stream

temperatures in the summer that should cause pre-spawning mortality. This is consistent with the Phase I objectives of this isolated-harvest program.

Observation and performance of the spring Chinook during Phase I of the program will provide essential information on the potential for their reintroduction and natural production in Phase II. Natural propagation of spring Chinook will likely require rehabilitation of key tributary streams and passage to historic spawning habitat above Lake Osoyoos.

4. "There should be a comprehensive description of the program of which this project is a part, including proposals 29042 and 29008."

The comprehensive description of this propagation program will be provided in the HGMP, including harvest and RM&E. Proposal #29042, Selective Fish Collection and Harvesting Gear, is a critical component of this Phase I production program as the project should provide the essential means of harvesting spring Chinook at a high rate while protecting non-target species and any ESA-listed spring Chinook that wander up, into the vicinity of the Okanogan River. Colville tribal members will be unable to sufficiently harvest spring Chinook without the development of more effective gear.

Proposal #29008, Adult Passage Counting and Trapping at Zosel Dam, is also an important component of the Phase I spring Chinook program. Marked spring Chinook that attempt to ascend Zosel Dam will be collected for tribal consumption. Later, the facility may also be used for brood stock collection. In the longer term, Phase II, should spring Chinook be reintroduced to habitat above Lake Osoyoos, the facility will be critical to the management and M&E of the species.

Should the production and M&E proposals for spring Chinook, summer/fall Chinook, and steelhead be funded, the management infrastructure will be created in the Okanogan River to more completely describe and refine the integration of the various habitat, propagation, and RM&E programs as has generally occurred elsewhere in the Columbia Basin. Much of this linkage and refinement will be evident from the completed HGMPs, and detailed RM&E plans for program evaluation and selective fishing.

REFERENCES:

Chapman, D. et al., "Status of Spring Chinook Salmon in the Mid-Columbia Region", April 24, 1995; Don Chapman Consultants Inc.

French, R. and Wahle, R, "Salmon Escapements above Rock Island Dam, 1954-60", March 1965; USFWS Special Scientific Report – Fisheries No. 493

Fulton, Leonard A., "Spawning Areas and Abundance of Chinook Salmon (Onchorhynchus tshawytscha) in the Columbia River Basin – Past and Present"

Langness, Olaf P., "Summer Chinook Salmon Spawning Ground Surveys of the Methow and Okanogan River Basins in 1990", February 1991.

Lichatowich, Jim, "A Conceptual Foundation for the Management of Native Salmonids in the Deschutes River", November 1998; Portland General Electric

ODFW, "Stock Assessment of Columbia River Anadromous Salmonids, Volume I – Chinook Salmon", November 1984; BPA project #83-335

Ray, Verne F., "Fisheries of the Confederated Tribes of the Colville Reservation", 1972

Spotts, J., "Columbia Basin System Planning, Draft Methow and Okanogan Subbasins", May 31, 1989.

PROJECT #29051: DEVELOP LOCAL OKANOGAN RIVER STEELHEAD BROODSTOCK

1. "…justify why a hatchery is warranted versus investing in Omak Creek rehabilitation…"

The purpose of this project is not to construct a hatchery rather than invest in habitat rehabilitation in Omak Creek. With the high mortality rates associated with upstream and downstream passage in the Columbia River, lower-basin harvest mortalities on natural-origin steelhead, and the degraded (but improving) condition of Okanogan basin habitat, supplementation of the naturally spawning steelhead population is necessary to maintain the population. In its hydrosystem biological opinion, NMFS (2000) estimated the median population growth rate for Upper Columbia River Steelhead ESU ranged from 0.94 to 0.66 depending on the effectiveness of hatchery-origin fish spawning in the wild. Given the degraded condition of Okanogan habitat, the population growth rate of steelhead in the subbasin is likely less. The ESU still has a high risk of extinction.

The need to supplement the endangered steelhead population at least until tributary habitat and mainstem passage conditions are improved is evident. The Colville Tribes are offering the use of an existing hatchery facility to undertake this program. The Scientific Review Team (1999) provided the following guidance, "Guideline 9. Hatchery programs should dedicate significant effort in developing small facilities designed for specific stream sites where supplementation and enhancement objectives are sought, using local stocks and ambient water in the facilities designed around engineered habitat to simulate the natural stream, whenever possible." The Tribes intend to pursue this advice with modification of the Cassimer Bar Hatchery and development of streamside acclimation facilities initially in Omak Creek. This course of action will detour from the large, centralized Wells Hatchery facility that raises a composite broodstock.

In addition to Omak Creek, the Tribes have proposed rehabilitating historical steelhead habitat in several other Okanogan tributaries. The conservation propagation program

initiated for Omak Creek would then be used to reintroduce steelhead into other tributary streams as they become viable habitat.

2. "…justify the creation of a local broodstock, when the population is likely homogenized through past hatchery and fishery management practices."

The steelhead population within the Okanogan subbasin has been substantially affected by the widespread stocking of steelhead from Wells Hatchery and is likely homogenized. However, the direction arising from NMFS' implementation of the ESA has been to replace composite broodstocks with local stocks, even if those stocks have been greatly affected by past hatchery practices. Currently, local steelhead broodstocks are being developed in the Touchet and Tucannon rivers of Washington that have been homogenized by the annual introduction of a composite hatchery stock from Lyons Ferry Hatchery. Likewise in the Grande Ronde River in Washington and Oregon, the composite stock from Wallowa Hatchery is being phased out with the development of at least two new, local broodstocks – both heavily affected by the Wallowa Hatchery stock.

The Scientific Review Team (1999) emphasized the importance of operating artificial propagation programs consistent with local stock structure. Their report states, "Development and adherence to strict genetic guidelines and breeding protocols consistent with local population structure is essential for effective hatchery contribution to wild production and maintenance of local genetic diversity."

3. "…even historically, steelhead abundance in the Okanogan system was likely quite low, as compared to other parts of the Columbia Basin."

Natural-origin steelhead from the Okanogan subbasin have likely been extremely limited in recent decades due to severe degradation of tributary habitat and passage through nine mainstem dams. Much of this tributary habitat degradation occurred well before the 20th century and decades before fishery biologists began surveying the subbasin and assessing fish populations.

A key issue today is whether with rehabilitation of tributary habitat, steelhead production in the Okanogan can contribute to the Federal government's trust responsibilities for the Colville Tribes and to the maintenance and recovery of the endangered Upper Columbia River Steelhead ESU. In this context, the comparison of the Okanogan system to other parts of the Columbia Basin is of less importance.

The availability of steelhead habitat to meet both tribal trust and ESA responsibilities in the Columbia Cascade Province has been severely constrained by the blockage caused by the construction of Grand Coulee and Chief Joseph dams. Rehabilitating habitat in the Okanogan system provides the only opportunity to restore the steelhead, a tribal trust resource, to the Colville Tribes. A rehabilitated Okanogan system also would, over time, significantly increase the distribution, diversity, and abundance of the ESU. All of these

improvements reduce the threats to the federal and PUD hydrosystem, and local agricultural economy from the restrictions of the ESA.

4. "Large-scale investment in steelhead projects in the Okanogan basin, such as the proposed hatchery in this proposal and the Salmon Creek project, appear less warranted based on the greater uncertainty of positive outcomes."

The proposed scale of investment for the Okanogan basin is relative compared to other recent and ongoing investments in hatchery facilities and habitat, lower in the Columbia Basin. Hatchery and tributary investments to increase the viability of other ESUs does not affect the Upper Columbia River Steelhead ESU; it is still endangered, at high risk of extinction, and a legal threat to the operations of the Federal Columbia River Power System, PUD hydroelectric projects, and the local economy of the Columbia Cascade Province. Similarly such lower basin hatchery and tributary habitat investments do not return one fish to the Colville Tribes to restore even a minimal ceremonial and subsistence fishery.

The proposed modification of the Cassimer Bar Hatchery will likely be a substantially smaller investment compared to the recent investments in the Yakima, Umatilla, and Clearwater subbasins to provide for recovery of less threatened ESUs and for the fishing needs of other tribes.

The proposed Salmon Creek project to restore flows in the lower 4 miles of the stream is expensive. The scope of the project is presently being reviewed through the NEPA process. A less costly alternative may possible to achieve salmon and steelhead access to spawning and rearing habitat.

Anadromous fish restoration in the Columbia Cascade Province and the Okanogan River will always have greater uncertainty and likely less positive outcomes due to its location above so many run-of-the-river hydroelectric dams and because much of the area has been blocked by Grand Coulee and Chief Joseph dams. This situation is largely why two of the province's anadromous fish species are currently endangered. Decisions on Fish and Wildlife Program investments must consider cost-effective opportunities within each ESA-listed ESU and within the waters and lands of each Native American tribe.

5. "…steelhead in the Okanogan basin appear to be very habitat limited and it is unlikely that restoration activities will restore them to levels capable of supporting any real degree of harvest."

There are several goals for restoring steelhead in the Okanogan basin. First as stated above, the most important goal is to recover the listed ESU (thereby removing the legal restrictions of the ESA) and provide tribal trust resources back to the lands and waters of the Colville Tribes. Secondly, more natural-origin steelhead are important to the ability

of the Tribes to pursue their ceremonial and subsistence fisheries, and for recreational anglers to have fishing opportunities. However, with regard to fisheries, the need for greater numbers of natural-origin fish is not to target them in fisheries, but to buffer the population as tribal members and anglers pursue hatchery-origin fish in selective fisheries.

In proposal #29042, the Colville Tribes would develop selective fishing gear to allow harvest of hatchery-origin fish while releasing, unharmed, non-target species, including natural-origin steelhead. Increasing the abundance, distribution, and diversity of natural-origin fish will improve the opportunity for the Colville Tribes and recreational anglers to harvest hatchery-origin fish. If habitat restoration is substantially effective and in brood years of high survival, directed harvest on natural-origin steelhead may be possible within the limitation of ensuring full escapements to the available habitat.

REFERENCES:

NMFS, "Biological Opinion on Operation of the Federal Columbia River Power System", December 21, 2000

Scientific Review Team, "Review of Artificial Production of Anadromous and Resident Fish in the Columbia River Basin: A Scientific Basis for Columbia River Production Programs", April 1999; Northwest Power Planning Council Document 99-4

[ISRPresponse302]