Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

ENVIRONMENT, FISH AND WILDLIFE

July 10, 2002

In reply refer to: KEW-4

Mr. Frank L. Cassidy, Chair
Northwest Power Planning Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348

Dear Mr. Cassidy,

The Bonneville Power Administration (Bonneville) requests the Northwest Power Planning Council recommend implementation of the "Safety-Net Artificial Propagation Program (SNAPP)", as described in Mountain Snake Provincial Review Proposal No. 28061.

At its June 11, 2002 meeting in Bend, the Council's Fish and Wildlife Committee referred the SNAPP proposal back to Bonneville for resolving ongoing concerns expressed by the Independent Scientific Review Panel (ISRP). Since project sponsors met with the ISRP in May, the SNAPP proposal and budget have been twice modified to address many of the issues raised by the independent scientists. Bonneville and the National Marine Fisheries Service (NMFS) believe the proposal and budget have been significantly and sufficiently improved as a result of the ISRP's comments and needs to proceed at this time.

The safety net or contingency planning outlined in the proposal is a critical Reasonable and Prudent Alternative of the NMFS 2000 Federal Columbia River Power System (FCRPS) Biological Opinion. The proposal enables the development of contingency artificial propagation intervention plans that would be triggered in emergency situations to preserve important, at-risk populations of Endangered Species Act-listed Chinook salmon and steelhead in the Snake Basin until the measures in the Fish and Wildlife Program and the FCRPS Biological Opinion take effect. These contingency plans are a critical performance element of the three, five and eight year check in's required by NMFS of the federal action agencies for implementation of the FCRPS Biological Opinion.

Bonneville and NMFS view the safety net plans as complimentary to, and not duplicative of, the forward-looking, subbasin/recovery plans under development by the Watershed Councils and the work of the Technical Recovery Teams. The SNAPP work plan now reflects the needed integration with these other planning efforts.

The safety-net plans, to be implemented only when absolutely necessary, would initiate short-term conservation measures prior to excessive population decline, and before flexible and cost-effective options are lost. Through SNAPP, the region should avoid further last-minute crisis interventions that come at greater biological risk and economic cost. While the improved salmon and steelhead runs of the past few years are encouraging, we know that this abundance has not been uniform across many natural-origin fish populations and may not continue. We can still anticipate leaner years ahead. We must be prepared to protect against further population extinctions that can only serve to make species recovery and Fish and Wildlife Program success more difficult and costly to achieve.

The attached document provides additional information, responding to concerns expressed by the Independent Scientific Review Panel and Council staff. Your attention to this issue would be appreciated.

Sincerely,

Robert J. Austin
Director for Fish and Wildlife

Enclosure:
SNAPP – Issues and Responses

cc:
Mr. Larry Rutter – National Marine Fisheries Service
Mr. Brian Brown - National Marine Fisheries Service
Mr. Rod Sando - Columbia Basin Fish and Wildlife Authority

July 10, 2002

SAFETY NET ARTIFICIAL PROPAGATION PROGRAM

ISSUES AND RESPONSES

Issue 1. The approval process for SNAPP interventions needs to be clearly stated in the SNAPP proposal.

Implementation of the SNAPP proposal and subsequent development of SNAPP contingency plans do not equate directly to implementation of new artificial propagation projects. The SNAPP proposal and associated funding ends at the development of contingency, intervention plans. SNAPP plans will include biological triggers that will alert the region to engage existing review and decision processes to consider implementation of a contingency plan. These processes include the Council's 3-Step Process, NMFS' section 10 permit or other applicable processes, application of policies from the Artificial Production Review, scientific review, NEPA, and Council action. Given the emergency nature of a SNAPP project, however, these processes may need to be expedited. The SNAPP proposal has been amended to clarify this decision review process.

Issue 2. Bonneville could fulfill the biological opinion's requirement for SNAPP through the subbasin planning effort or Technical Recovery Teams

The original consolidated SNAPP proposal was developed and submitted to the provincial funding process prior to the formation of the TRT and development of its work plan. The initial SNAPP proposal anticipated coordination with the TRT, yet integration of the two planning efforts was not possible at that time. The SNAPP work plan has now been coordinated with the co-chairs of the TRT. Consequently, in two key areas, population delineations and extinction risk analyses, these planning efforts have been fully integrated resulting in substantial savings in the SNAPP budget. To ensure consistency in planning efforts, SNAPP will now replace its original list of Snake Basin spring/summer Chinook and steelhead populations to be evaluated for extinction risk with the population structure that will arise from TRT deliberations. SNAPP-funded scientists will work through and assist the TRT, via its Viability Subgroup, in conducting the extinction risk analyses necessary for both efforts. This too has resulted in cost savings in the SNAPP budget and is reflected in the revised SNAPP proposal. Following the completion of extinction risk analyses, SNAPP participants will develop and analyze intervention options and develop contingency plans, with product reviews by the TRT.

The SNAPP proposal also now reflects key, coordination milestones with subbasin planning. SNAPP will inform appropriate planners of the results of the extinction risk analyses, particularly findings of excessive extinction risk, for populations in their subbasins. SNAPP

participants will seek from the subbasin planners their recommendations on intervention options for benefit-risk analysis and contingency planning. Should the most biologically beneficial and cost-effective option be habitat or passage (non-propagation) activities, this information would be immediately provided to the planners for consideration as priority action in their plans. If the artificial propagation option must be chosen, its development would be coordinated with planners and ultimately incorporated into appropriate subbasin plans.

The development, analysis, and planning for artificial propagation are very technical and specialized. These efforts should be coordinated and integrated with TRT and subbasin planning efforts, but are best conducted by those with scientific and management knowledge and experience.

Issue 3. SNAPP is biased towards, and presumes the use of, artificial propagation as the conservation measure to use in the safety net.

The proposal has been modified to clarify that artificial propagation intervention is an option of last resort. The goal of SNAPP is a prompt increase in population abundance to avoid extinction or serious genetic risks. But, if that goal can and will be met without artificial propagation, then a habitat-based alternative will be preferred. It must be realized though that most habitat enhancement actions take years, if not decades, to become effective and therefore may not achieve the objective of immediate increases in fish abundance should the need arise. A final assessment of pending habitat measures will also be an integral part of the "triggering" decision process.

Additionally, to avoid any bias toward artificial propagation resulting from incomplete information and to minimize the diversion of funds from long term, habitat-based solutions to declines in population viability, the SNAPP proposal presumes that the default action in the face of uncertainty about the need for the action is non-intervention. Therefore, use of artificial propagation will only occur if the conclusion of net biological benefits is compelling relative to alternative actions or no action.

The decision process for implementing a SNAPP project also contains significant checks and balances to ensure new artificial production actions are beneficial and necessary. Implementation decisions that come before the Council will be fully informed and public. Any SNAPP project will also need to receive the scrutiny of the applicable ESA processes administered by NMFS.

There is considerable disagreement, if not discord, in the region about the use of artificial production. Some maintain that it has been inappropriately relied upon historically as a mitigation panacea for the adverse impacts of hydrosystem and other economic development, yet is viewed by many as the most feasible and successful option for meeting societal and tribal treaty demands for fish. These differences in perspectives are fueled by the uncertainty surrounding the positive and negative effects of artificially produced fish. SNAPP sponsors

anticipate applying the full and most current scientific information and methods in consideration and development of contingency plans in an effort to minimize the "philosophical" debate about artificial production.

Issue 4. The methods proposed for extinction risk analysis and benefit-risk analysis are too qualitative and insufficiently quantitative, are largely subjective, and therefore too vague to guide decision-makers.

The SNAPP proposal has been amended to clarify its analytical methods. SNAPP intends to use the best available information and methods to evaluate extinction risk of populations and to evaluate the benefits and risks of various options to minimize extinction risk. As the ISRP has commented, these methods are in many cases new or under development and often not as quantifiable as preferred. Given their shortcomings, the methods are still the best available to organize and evaluate the data at hand, and inform decisions on whether or not, and how, to intervene. The need for contingency planning to guide better, more timely decisions on intervention is paramount irrespective of the shortcomings of available methods to aid decision-making.

Analytical methods are often not deterministic, yet must be used to inform necessary decisions. Such methods are also improved by their use and application. The alternative to not applying best available information and methods to real-time problems is that needed action is not taken or taken too late, when they are more costly and less effective. The region has demonstrated that behavior by waiting too long and then needing to implement drastic, costly, and yet necessary measures such as captive broodstock programs.

Issue 5. Benefit-risk analysis should be performed on all options considered, not just the recommended alternative.

The SNAPP proposal has been altered to reflect that benefit-risk analysis will be performed on all options and used as the primary means (along with cost and feasibility analyses) to select and then evaluate the preferred conservation option upon which a contingency plan will be developed.

Issue 6. Implementation of a SNAPP project should be consistent with the policies and implementation of the Council's Artificial Production Review.

Coordination of SNAPP activities and products will be undertaken through the Council's Artificial Production Advisory Committee. The progress and direction of the Artificial Production Review and Evaluation will also be integrated into SNAPP. Any contingency plans developed in SNAPP will specifically address the principles and policies adopted in the region's Artificial Production Review.

July 9, 2002

BUDGET FOR SNAPP PROPOSAL

TASK 1.1: FY'02	**$0**
TASK 2.1: FY'02	
Independent experts review	$8,000
Gather & summarize life history data	$15,000
Gather existing genetic data	$0
Conduct genetic analyses	$15,000
Peer Review publication	$30,000
M&E on M.F. critical uncertainties	$10,000
NPT total	**$78,000**
TASK 1.2: FY'02	
CRITFC ERA analyses	$20,000
General SNAPP coordination, product review & comment – CRITFC	$5,000
General SNAPP coordination, product review & comment – IDFG	$15,000
General SNAPP coordination, product review & comment – WDFW	$2,000
General SNAPP coordination, product review & comment – SBT	$15,000
General SNAPP coordination, product review & comment – NPT	$15,000
ERA data assembly – IDFG (now funded via TRT)	$0
ERA data assembly – WDFW	$2,000
ERA data assembly – SBT	$10,000
ERA data assembly – NPT	$15,000
Expert review (2) on 3 draft ERAs 5hrs/draft/expert @$125/hr	$4,000
	$103,000
TASK 1.3 FY'02 – FY'03	
Options development on 12 populations x $4,000/pop.	$48,000
Benefit/Risk Analyses on 12 populations x $15,000/pop.	$180,000
Expert review (2) on 3 draft BR-As 5hrs/draft/expert @$125/hr	$4,000
	$232,000
TASK 1.4 FY'03 – FY'04	
Complete HGMPs on 10 populations x $15,000/pop.	$150,000
General SNAPP coordination, product review & comment – CRITFC	$15,000
General SNAPP coordination, product review & comment – IDFG	$15,000
General SNAPP coordination, product review & comment – WDFW	$2,000
General SNAPP coordination, product review & comment – SBT	$15,000

General SNAPP coordination, product review & comment – NPT	$15,000
	$215,000

Subtotal FY'02	$411,000
Subtotal FY'03	$215,000
GRAND TOTAL	**$626,000**

Note: cost of 5 "replaced proposals"	FY'02 =	$583,100
	3 years =	$1,105,500
Cost of the original # 28061 SNAPP proposal	FY'02 =	$540,000
	2 years =	$840,000

[SNAPPbudgetCalc702]

November 21, 2001

BUDGET FOR SNAPP PROPOSAL

TASK 1.1: FY'02			**$0**
TASK 2.1: FY'02			
Independent experts review			$7,400
Gather & summarize life history data			$14,800
Gather existing genetic data			$14,800
Conduct genetic analyses			$14,800
Peer Review publication			$30,000
M&E on M.F. critical uncertainties			$10,000
NPT total	$91,800	=	**$92,000**
TASK 1.2: FY'02			
CRITFC ERA analyses			$40,000
General SNAPP coordination, product review & comment – CRITFC			$5,000
General SNAPP coordination, product review & comment – IDFG			$15,000
General SNAPP coordination, product review & comment – WDFW			$2,000
General SNAPP coordination, product review & comment – SBT			$15,000
General SNAPP coordination, product review & comment – NPT			$15,000
ERA data assembly – IDFG			$20,000
ERA data assembly – WDFW			$2,000
ERA data assembly – SBT			$10,000
ERA data assembly – NPT			$15,000
Expert review (2) on 3 draft ERAs 5hrs/draft/expert @$125/hr			$4,000
			$143,000
TASK 1.3 FY'02 – FY'03			
Options development on 19 populations x $4,000/pop.			**$76,000**
TASK 1.4 FY'02 – FY'03			
Benefit/Risk Analyses on 15 populations x $15,000/pop.			$225,000
Expert review (2) on 3 draft BR-As 5hrs/draft/expert @$125/hr			$4,000
			$229,000

TASK 1.5 FY'03 – FY'04

Complete HGMPs on 15 populations x $15,000/pop.		$225,000
General SNAPP coordination, product review & comment – CRITFC		$15,000
General SNAPP coordination, product review & comment – IDFG		$15,000
General SNAPP coordination, product review & comment – WDFW		$2,000
General SNAPP coordination, product review & comment – SBT		$15,000
General SNAPP coordination, product review & comment – NPT		$15,000
	$287,000 =	**$290,000**

Subtotal FY'02	$540,000
Subtotal FY'03	$290,000
GRAND TOTAL	**$830,000**

Note: cost of 5 "replaced proposals" FY'02 = $583,100
3 years = $1,105,500

[SNAPPbudgetCalc]

Project ID: # 28061 – Revised, July 8, 2002

Title: Safety-Net Artificial Propagation Program (SNAPP)

Section 9 of 10. Project description

a. Abstract

The National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service, Bonneville Power Administration (acting on behalf of the Action Agencies for the Federal Columbia River Power System), and the fishery co-managers of the Snake River Basin have formed a Safety-Net Artificial Propagation Program (SNAPP) to implement RPA measure 175 from the FCRPS Biological Opinion. The purpose of this program is to establish contingency action plans, applying the best available artificial propagation techniques, for possible implementation to prevent extinction of key populations of ESA-listed salmon and steelhead while necessary improvements to main-stem passage and tributary habitats are effectuated. The program's goal is to reduce the short-term risks of population extinctions and preserve stock structure and genetic variability that will contribute to future recovery. Implementation of SNAPP contingency plans, developed as products of this proposal, is not included in this proposal. Decisions to implement a SNAPP contingency plan will follow Council and NMFS processes for artificial production programs..

b. Technical and/or scientific background

Snake River spring/summer chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mysis*) have declined to dangerously low levels and are listed as threatened under the Endangered Species Act (ESA). For example, the population trends of salmon spawning aggregates in the Middle Fork Salmon River genetic refuge are in significant decline and salmon are at low levels of abundance and subsequent high demographic risk. Three of the seven index stocks used in the National Marine Fisheries Service (NMFS) Draft Cumulative Risk Initiative (CRI; NMFS-NOAA July 17, 2000) occur in tributaries of the Middle Fork Salmon River. The CRI states:

> *"The seven Snake River spring/summer Chinook salmon index stocks are experiencing a decreasing trend in population change. This trend appears to have worsened in the most recent years for which we have complete data (1990-1994). Without additional intervention, the long-term prognosis for these stocks is clearly extremely poor."*

Further, three of the seven index stock used in the PATH (Beamesderfer et al 1998 and Draft CRI (NMFS-NOAA July 17, 2000) analyses occur within the Middle Fork Salmon River sub-basin and have population growth rates (lambda) below replacement for 1990 through 1999: Marsh Creek (Lambda = 0.675), Bear Valley/Elk Creek (Lambda = 0.812), and Sulphur Creek (Lambda = 0.681). Key finding number 8 in the Draft CRI's Summary of Key Findings states: *"The most recent data for Snake River Spring/Summer Chinook salmon reveal that this ESU may be doing worse than was previously thought.*

It is now even less likely that dam breaching by itself will mitigate imminent risks faced by Snake River Spring/Summer Chinook salmon. Importantly, there are no data to indicate that improvements in any of the other H's (i.e., habitat, harvest, or hatcheries) could by themselves, mitigate the extinction risks faced by the Snake River Spring/Summer Chinook ESU."

The Salmon Subbasin Summary (Servheen et al. 2001) reports that *"annual redd counts for the index populations have dropped to zero three times in Sulphur Creek and twice in Marsh Creek, and zero counts have been observed in spawning areas elsewhere within the Salmon Subbasin."* Kucera and Blenden (1999) reported that all five "index populations" (spawning aggregations) of stream-type Chinook in the Salmon Sub-basin, fish that spawn in specific areas of the Middle Fork and South Fork Salmon watersheds, exhibited highly significant ($p<0.01$) declines in abundance during the period 1957-95.

For steelhead, a comparison of the average 1964-1968 natural steelhead return to the uppermost Snake River Dam compared to the average 1996-2000 steelhead return illustrates an 82% decline in naturally-produced Snake Basin steelhead. For individual populations, decline may have been even more significant prompting NMFS to suggest that safety-net action, in the form of artificial production intervention, may be necessary.

The above references illustrating the worrisome status of Snake basin anadromous fish must and will, however, be examined in light of substantially improved runs in 2000 and 2001. Fishery managers are also expecting similarly improved runs of spring Chinook and steelhead in 2002.

c. Rationale and significance to Regional Programs

On December 21, 2000, NMFS issued its "Endangered Species Act Section 7 Biological Opinion on the Re-initiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin" (Hydro BiOp). In this document, the National Marine Fisheries Service concluded that the impacts of the Federal Columbia River Power System (FCRPS) jeopardize the continued existence of 8 of the 12 listed salmon and steelhead Evolutionarily Significant Units (ESU) listed pursuant to the Endangered Species Act (ESA). NMFS further stated that implementation of the reasonable and prudent alternative included in the Hydro BiOP would avoid jeopardy to the listed ESUs.

Integral to the reasonable and prudent alternative (RPA), are offsite mitigation actions designed to increase the certainty and reliability of attaining increased survival of listed fish. This mitigation includes actions to reform existing hatchery programs and to create a Safety-Net Artificial Propagation Program. The objective of SNAPP is to prepare contingency plans for Chinook and steelhead populations or population components in case short-term intervention with artificial propagation techniques is necessary to reduce an excessive risk of extinction. In SNAPP, artificial propagation is not presumed to be a long-term solution for recovery of ESA-listed species, but a possible interim measure

until sufficient survival benefits from habitat and passage improvements are realized. SNAPP is not a replacement for correcting the causative factors for salmon and steelhead decline.

The Hydro BiOp (in Action #175) identifies 10 populations of listed salmon and steelhead for which intervention may be warranted. Other fish populations may warrant review for intervention and should be considered before declining to such a depressed state that highly intrusive and expensive propagation techniques are necessary. Pursuant to Actions #177 and #178, in 2002, BPA is to fund implementation of any of the above safety-net projects deemed necessary and be prepared to fund further safety-net interventions for high-risk fish populations during the 10-year term of the Hydro BiOp.

Any safety-net intervention is to be based on a four-step planning process to ensure its efficacy:

Step 1: Perform an extinction risk analysis on the depressed fish population
Step 2: Develop intervention options and a recommended strategy
Step 3: Perform a benefit-risk analysis for the recommended strategy
Step 4: Develop an HGMP to guide implementation.

Based on comments of the Independent Scientific Review Panel (ISRP), Steps 2 and 3 will be combined to reflect the use of benefit-risk analysis in evaluating all intervention options and to guide selection of a recommended strategy.

The Hydro BiOp emphasizes urgency in implementing SNAPP to avoid additional population extinctions and provide interim benefits of artificial propagation while mitigation actions for the FCRPS and tributary habitats take effect and contribute to fish recovery. Planning must be conducted based on current information and methods, and avoid excessive delays. The closer individual populations get to extinction, the more radical and expensive propagation options become. Delayed interventions also provide less benefit to species survival.

Since completion of the BiOp, SNAPP participants reviewed the initial list of 10 populations and decided on two significant changes. First, the list was expanded to 38 "at risk" populations (see Task 1.1). Second, SNAPP participants decided that rather than taking each "at risk" population through all four planning steps, the results of the step 1, extinction risk analysis, should be evaluated to assess if the extinction risk would justify completing the last three steps of the process. Only those populations at excessive risk of extinction would be evaluated for intervention.

The Technical Recovery Team (TRT), recently convened by NMFS, will be recommending population delineations (and possibly population components) within the Snake River Spring/Summer Chinook and Snake River Steelhead ESUs. The SNAPP project will rely upon these delineations to conduct the extinction risk analyses in Step 1. SNAPP participants will also work jointly with the TRT's Viability Subgroup to perform the extinction risk analyses contemplated in Step 1.

Development of a successful contingency planning program will allow the region to track the viability of fish populations and be prepared to act expeditiously should an emergency situation arise. Being prepared to take an emergency, intervention action in a timely manner will minimize the future need to implement captive brood programs that are biologically more risky and often more expensive than other propagation alternatives. Contingency planning will also allow the region to avoid situations where populations or population components decline to such low levels that resulting intervention requires undesirable pooling of remaining individuals, with consequent loss of between-population diversity.

d. Relationships to other projects

This SNAPP proposal is intended to replace the following Mountain Snake projects that were submitted earlier:

#28057:	Four-Step Safety-Net Plan for Lower Salmon River A-Run Steelhead
#28056:	Four-Step Safety-Net Plan for South Fork Salmon River B-Run Steelhead
#28055:	Four-Step Safety-Net Plan for Upper Lochsa River B-Run Steelhead
#28012:	Four-Step Planning to Identify Safety-Net Projects for Idaho Steelhead
#28015:	Benefit/Risk Analysis to Promote Long-Term Persistence of Chinook Salmon in the Middle Fork Salmon River

This project will be undertaken in close coordination with the Council and NMFS efforts to have Hatchery and Genetic Management Plans developed for all artificial production programs in the Columbia River basin. SNAPP will be coordinated through the Council's Artificial Production Advisory Committee and will remain abreast of technical and policy developments from the Council's Artificial Production Review and Evaluation.

SNAPP work tasks have been integrated with efforts of the Technical Recovery Team to the extent appropriate. SNAPP will use the population delineations being developed by the TRT and will work in unison with the TRT on the extinction risk analyses. Further SNAPP work products (benefit-risk analyses and HGMP contingency plans) will be offered to the TRT for review and comment.

SNAPP will interact with subbasin planners at critical points. SNAPP contingency planning will compliment the long-range planning for species recovery and enhancement. SNAPP can provide unique and specialized contingency planning to supplement the subbasin planning process that is less suited to perform the scientifically-intensive extinction risk and benefit-risk analyses. For those populations deemed by SNAPP to be at excessive risk of extinction, appropriate subbasin planners will be notified of the analytical results. Planners will be requested to provide any habitat-related options that could meet SNAPP goals to promptly reduce extinction risk. Should benefit-risk analysis indicate that a habitat-related option would be the best contingency plan, SNAPP will immediately notify subbasin planners to fully consider the option for immediate inclusion as a priority action in the subbasin plan. Similarly, should artificial propagation be the

best contingency option, subbasin planner will be requested to review SNAPP plans and include the final contingency plan in the subbasin plan.

The information collected and analyzed in Step 1 of SNAPP, Extinction Risk Analysis, will be coordinated with U.S. v Oregon parties for consideration in their planning.

Existing projects that are integral to SNAPP are:

#199005500: IDFG Steelhead Supplementation Studies in Idaho Rivers – will provide data needed for SNAPP planning.
#199107300: IDFG Natural Production Monitoring - will provide data needed for SNAPP planning.
#199700100: IDFG Captive rearing Project for Salmon River Chinook Salmon – will provide methodology needed for planning.
#199705700: Shoshone-bannock Tribes Salmon River Production Program – will provide data needed for planning.
#199703800: Nez Perce Tribe Preserve Salmonid Gametes Program – will provide data and methodology needed for planning.
#200101-200126: Lower Snake River Compensation Program – will provide data and methodology needed for planning and administer any implementation of resulting HGMPs.
#20001700: Kelt Reconditioning – will provide methodology needed for planning.
#199902000: Analyze the Persistence and Spatial Dynamics of Snake River Chinook Salmon – will provide data for analyses.

e. Project history

This is a new project start.

In 2001, NMFS and BPA contracted with Stephen H Smith Fisheries Consulting Inc. to develop a process and organizational structure for implementing RPA # 175. The Safety-Net Artificial Propagation Program arose from this work. This was followed by a later contract to coordinate and facilitate implementation of SNAPP. A Core Team was established, consisting of BPA, NMFS, and USFWS, that meet regularly to oversee SNAPP formation and implementation. Subsequently a Snake Partners Group has been convened consisting of fishery co-managers with management jurisdiction over Chinook and steelhead populations under consideration within SNAPP. This group consists of Idaho Department of Fish & Game, Nez Perce Tribe, Shoshone-Bannock Tribe, and is assisted significantly by the Columbia River Intertribal Fish Commission. The Oregon Department of Fish & Wildlife, Washington Department of Fish & Wildlife, and the Umatilla Tribe participate on a more limited basis. Together, these management entities have been further developing SNAPP, refining methods for implementing the 4 steps, and finalizing a list of fish populations that need to be considered within SNAPP.

At the time of the initial Mountain Snake project solicitation, the above coordination mechanism was not in place. Consequently several proposals to implement RPA #175

were submitted. This project proposal is a result of a collaborative and consolidated approach to implementing RPA # 175. Further explanation of the process to date was provided in October 10, 2001 comments to the ISRP from Stephen Smith. Because this consolidated proposal was not prepared until the final weeks of the ISRP's Mountain Snake Provincial review, the SNAPP sponsors were unable to make a presentation to the ISRP and participate in the normal "fix-it" loop to address the ISRP comments.

The SNAPP proposal has now been reviewed by the ISRP. Many of its comments were integrated into this proposal. SNAPP sponsors subsequently met with the ISRP resulting in additional modifications to this proposal.

f. Proposal objectives, tasks and methods

Goal: Avoid extinction of important salmon and steelhead populations while improvements to main-stem passage and tributary habitats are determined, implemented and effectuated.

Objective 1: Develop and maintain current artificial propagation contingency plans for possible intervention on populations at excessive risk of extinction.
Objective 2: Determine stock structure of spring/summer Chinook in the Middle Fork Salmon sub-basin.
Objective 3: Implement contingency plans as necessary and appropriate (not included in this proposal).

The tasks in this proposal are derived directly from RPA 175, and include: 1) reviewing the work of the TRT, determine the delineations of salmon and steelhead populations that make up the Snake basin ESUs; 2) working with the TRT, conduct extinction risk analyses (ERA) on those populations or population components; 3) for those populations deemed at excessive risk of extinction, develop management intervention options (habitat-based and production-based); 4) use benefit-risk analysis, cost-effectiveness analysis, and feasibility analysis to evaluate the intervention options, and select a preferred option; 5) develop a Contingency Hatchery and Genetic Management Plan (CHGMP) for the preferred option; 6) review and amend the CHGMPs as necessary based on pertinent new information . The objectives and associated tasks and methods are discussed below.

Objective 3, the implementation of contingency plans, is not included in this proposal as the basis for budgeting would be highly speculative pending the completion of CHGMPs. Each contingency plan developed in task 5 will include biologically based decision triggers for implementation purposes. Should a population reach a state where it is at excessive risk of extinction, the trigger would initiate an expedited, regional review to decide if the contingency plan would be implemented. This review would include the Council's 3-Step Process, NMFS's regulatory review processes pursuant to the Endangered Species Act, NEPA, and ultimately a regional decision on whether to fund and implement the contingency plan.

TASK 1.1 "At-Risk" Population List

The SNAPP fisheries managers determined that the status of the following salmon and steelhead populations (see below) are of sufficient concern that they should undergo an Extinction Risk Analysis (Step 1 of the SNAPP process). The populations would be individually assessed in three sequential groups as indicated by their priority.

Since development of this list of At-Risk populations, the TRT has initiated its work on delineation of species populations and population components. The TRT's preliminary population list (from its March 2002 meeting) is very similar to that below. The SNAPP intends to proceed with the extinction risk analyses, in conjunction with the TRT, only after obtaining the TRT's list of populations. SNAPP will use the TRT's delineation of populations and population components for the extinction risk analyses in Step 1.

The TRT is planning on having preliminary identification of metapopulation structures for Snake River Spring/Summer Chinook and Snake River Steelhead available in September 2002, with final delineations in December 2002. SNAPP should be able to set its work schedule and population priorities for extinction risk analyses based on TRT drafts and TRT deliberations in mid to late summer 2002.

SNAPP participants will review the population and life history information already available to the TRT to determine if additional information exists that would assist the TRT deliberations on metapopulation structure.

Initial List of "At-Risk" Spring/Summer Chinook Populations (25), November 2001	priority
Main-stem Middle Fork Salmon River, to Indian Creek	1
Camas Creek	1
Lower Big Creek	1
Upper Big Creek	1
Loon Creek	1
Tributaries to the mid Middle Fork Salmon River (Marble, Indian, Pistol, Rapid)	1
Upper Main-stem Middle Fork Salmon River	1
Sulphur Creek	1
Marsh Creek	1
Bear Valley Creek	1
Elk Creek	1
Upper Salmon River Tributaries, N.F. to Redfish Lake Creek	2
Yankee Fork	2
West Fork Yankee Fork	2
Upper Valley Creek	2
Lower Valley Creek	2
Upper East Fork Salmon River	2
Lower East Fork Salmon River	2

Main-stem Salmon River, Lemhi to Redfish Lake Creek	2
Lower Salmon River Tributaries, mouth to French Creek (Whitebird, Slate)	3
Rapid River	3
Lower Main-stem South Fork Salmon River	3
Secesh River	3
Tributaries of the Salmon River Canyon, French to North Fork (Bargamin, Chamberlain)	3

Initial List of "At-Risk" Steelhead Populations (13)

	priority
Lochsa River	1
Tributaries of the Salmon River Canyon, French to N.F.	1
Rapid River	1
Selway River	2
Tributaries of the Lower Clearwater, excluding Lolo Creek	2
Tributaries of the Middle Fork Clearwater River	2
Tributaries of the Upper Salmon River, Above North Fork	3
Yankee Fork	3
East Fork Salmon River	3
Middle Fork Salmon River	3
South Fork Salmon River	3
Tributaries of the Lower Salmon River, mouth to French	3
Tributaries of the Snake River	3

The SNAPP participants will revise the At-Risk population list based on the population delineations of the TRT. A prioritized population list will be developed with the TRT to guide extinction risk analyses.

SNAPP participants realize that several of the populations on the At-Risk list have been designated as controls in ongoing supplementation experiments. The role of these populations as experimental controls will be fully considered and documented in the SNAPP process. However, should any of these populations be deemed at excessive risk of extinction, fishery managers would need to decide whether to maintain the populations in their role as experimental controls or to implement a safety-net intervention to preserve their viability. The decision threshold to intervene on an experimental control population would obviously be higher than for others.

TASK 2.1. Middle Fork Spring/Summer Chinook Population Structure

The meta-population stock structure of spring/summer Chinook in the Middle Fork Salmon River needs to be determined. Existing genetic data needs to be analyzed and evaluated for genetic uniqueness, genetic similarity, and gene flow. Opportunities to expand this genetic information with archived scale samples need to be identified. Genetic analysis of the archived scale samples would establish the historical stock structure and allow a comparison with current meta-population stock structure. This

information will supplement the work of the TRT to delineate population structure, be integrated into the Extinction Risk Analyses conducted in Task 1.2, and be critical to developing potential intervention strategies and options in Task 1.3.

A. Analyze Existing Genetic Data

The task will entail gathering and analyzing all genetic data relevant to Middle Fork Salmon River (MFSR) stocks to ascertain current meta-population stock structure. This task will be performed by the TRT independent of the SNAPP budget. SNAPP participants will review and comment on TRT findings.

B. Expand Genetic Data

Scale and fin samples from M.F. spring/summer Chinook have been collected and archived by multiple agencies for a number of years. These collections will be examined and a determination made as to whether additional genetic analyses can be performed on these samples. This information should allow a determination of historic stock structure based on genetic uniqueness, genetic similarity, and gene flow.

This task will be performed by SNAPP participants. The results of these genetic analyses will be evaluated relative to the population delineation performed by the TRT. The results of these genetic analyses and evaluation will be provided to the TRT for it review and use in confirming or adjusting its initial delineation of MFSR stock structure.

C. Determine Meta-population Structure

From steps A and B, an historic and current meta-population stock structure for spring/summer Chinook in the Middle Fork Salmon River can be determined. This evaluation will be provided to the TRT, which can then confirm or adjust its initial determination meta-population structure. The meta-population structure will be essential to determining options for contingency planning for any interventions. This task will be performed in coordination with the TRT.

D. Life History Data

Life history data on spring/summer Chinook will be gathered and summarized. This information will be compared to the genetic analyses and used in the formulation of any intervention strategies in Task 1.3 and Benefit/Risk Analyses in Task 1.4. This work will be undertaken only as needed to support and supplement that conducted by the TRT.

E. Publish Peer Reviewed Paper

Develop a peer review publication on the status of Middle Fork Salmon River Chinook salmon and the role of contingency planning to be published in Conservation Biology, North American Journal Fisheries Science, or other professional fisheries publication

TASK 1.2. Extinction Risk Analysis

An extinction risk analysis for each salmon and steelhead population or population component included in the "At-Risk List" will be completed in conjunction with the TRT to determine whether a safety-net artificial propagation plan may be necessary or prudent. These analyses will be conducted on individual populations, population components, or both depending on the population delineations determined in the TRT process. In addition, the ERA will provide guidance regarding the intensity of management intervention necessary, the time frame for implementation of an intervention strategy, and prioritization of possible interventions. The ERA will be performed within the structure of the TRT, with SNAPP principal investigators participating on the TRT's Viability Subgroup. Draft ERAs will be reviewed by the SNAPP group, the TRT, and undergo scientific review before determining whether a given at-risk population should proceed to Tasks 1.3-1.5

A. Review existing extinction risk analyses.

For some populations (e.g. spr/sum Chinook) on the "At-Risk List", ERA has or is currently being conducted. This information will be reviewed and included in the Task 1.2 reports. This review will be conducted within the Viability Subgroup of the TRT, supplemented by two SNAPP participants (Beasley and Sharma)

B. Gather existing data.

Completion of a comprehensive ERA will require access to all available data regarding the status of each salmon and steelhead population on the "At-Risk List".

Methods: SNAPP participants will work within the TRT's Viability Subgroup to finish obtaining all of the pertinent population and life history information necessary for the TRT and NMFS to perform their species' status reviews. Integration of SNAPP participants will ensure that ERAs are conducted at the population and sub-population levels necessary for consideration in SNAPP contingency planning. Working within the TRT structure will reduce the data collation effort originally forecast for this SNAPP task. SNAPP participants will fill any data gaps in the information currently accumulated by the TRT.

C. Perform Extinction Risk Analyses.

Extinction Risk Analyses will be performed within the TRT Viability Subgroup. Two SNAPP investigators will work within the Subgroup to assist in this joint effort. ERA methods will be determined working with the TRT. We anticipate applying a maximum likelihood tool as one means to complete the ERA, to be supplemented with other models where sufficient data are available to perform such methods. Methods may vary by population depending on data availability. ERA will be performed on individual population components or management units and also on aggregated components (populations) to achieve the most robust analysis.

Using a time series of adult abundance (e.g., dam counts, redds, weir counts etc.) and juvenile data, the maximum likelihood tool returns a distribution of population growth rates given the observed data. These values will allow us to infer: 1) whether a population is increasing, decreasing, or stable; 2) the amount of confidence that we can have in the available data (and resulting analyses); and 3) the rate at which a population is declining or increasing.

Methods: The methods that we will employ for maximum likelihood analysis are modified from Wade (2000). Often, data regarding population trends demonstrate considerable variation over time. As a result, determining whether a given population is stable versus declining can be difficult. Similarly, given two populations with uncertain growth rates, it is often difficult to determine which population should receive management priority. Typically, researchers have employed simple linear regression to determine whether a population is increasing, stable, or decreasing. However, due to the stochastic nature of salmonid abundance, data such as redd counts or counts of adult returns may be insufficient to statistically distinguish between alternatives using simple linear regression. Following Wade (2000), we employ a maximum likelihood procedure as a means to scale uncertainty. To do so, we perform a simple linear regression of the data. We then calculate the probability of a variety of slope values given the observed data. This probability distribution can be used to visualize the likelihood that a population is truly declining (negative), stable (zero), or increasing (positive). In addition, the shape of the distribution is a qualitative indicator of the faith that we should have in the data. For example, a distribution with a greater central tendency (values clustered around a given value, with low dispersion (ie., short "tails")) suggests that we should have higher certainty in the slope estimator. In addition, we can use this method to calculate the relative change in population size, which can be used to estimate the rate of population change on many temporal scales (e.g., yearly or by generation length). This may be useful as a means to prioritize populations with a greater need for management intervention. For example, if two upper Lochsa River spawning aggregates are identified, it may be useful to prioritize which aggregate should receive management priority.

Additional Methods: The TRT Viability Subgroup and its investigators will apply additional methods where they believe that available data on a population's status are sufficient and the results of the maximum likelihood analysis would be enhanced. The TRT is currently evaluating several methods for their use.

Working with the TRT, SNAPP investigators will develop a threshold(s) for "excessive risk of extinction" that will guide the selection of populations or population components for further investigation in Steps 2-4 of the SNAPP process. This threshold would also be used within any contingency plan to guide or trigger an actual decision process on whether to implement an intervention plan.

The TRT may propose "quasi extinction thresholds", a population level below which productivity is unknown and extinction risks consequently high. The SNAPP threshold(s) for intervention would necessarily by higher than that of the TRT. SNAPP and TRT scientists will ensure that the necessary decision thresholds are related. SNAPP may also consider more than one threshold to trigger interventions based on the metapopulation structure of each ESU and the guidance of the TRT for needed population structure to avoid jeopardy and achieve recovery. The threshold for excessive risk of extinction will likely be based on the concept of effective population size (Ne) and genetic considerations of a founding population size.

D. Agency and expert review/consultation.
Expert and public review of extinction risk analyses will be conducted through the TRT process. This will include interested co-managers, agencies, and scientific entities. The review will seek comments on the ERA for both TRT and SNAPP purposes and applications.

E. Determination of Excessive Risk of Extinction
The SNAPP Coordinator and ERA investigators will convene the SNAPP participants to review the ERA results and technical recommendations regarding excessive extinction risk. SNAPP participants will then prepare recommendations for NMFS and the Action Agencies (primarily BPA) on which populations and population components should proceed through Steps 2-4. The TRT will be asked to review these recommendations. Appropriate subbasin planners will also be notified of findings.

TASK 1.3. Development of Intervention Strategies and Benefit-Risk Analysis
For each at-risk population that NMFS and the Action Agencies conclude that the ERA indicates excessive risk of extinction, the next step, identification of intervention alternatives, will be performed. Options for intervention with artificial propagation will only be developed for those populations that can not be sufficiently improved in the necessary timeframe with ongoing and planned mainstem passage and tributary habitat improvements. Options that implement measures other than artificial propagation techniques will sought from subbasin planners and be fully considered. SNAPP will review the recent and planned enhancements of tributary habitats and mainstem passage that could affect an at-risk population. While the full range of intervention alternatives will be considered, the ultimate, preferred option must be one that can be implemented and become effective within a timeframe sufficient to achieve the goal of SNAPP. A preferred option must provide net benefits to the listed population as confirmed by benefit/risk assessment. The preferred option must also be logistically and fiscally feasible. It is recognized that the preferred strategy will be developed and selected based largely on the benefit/risk analysis conducted in Task 1.4. The benefit/risk analyses will not be conducted subsequent to option development, but as an integral part of this task. If the preferred option is other than artificial propagation, such recommendation will be forwarded to BPA, NMFS, fishery co-managers, and subbasin planners for their

consideration in development of subbasin plans. SNAPP will not develop the contingency plan for a habitat or passage option, but will rely on subbasin planners to develop details and expedite such actions.

The TRT, working with subbasin planners, will be preparing limiting factors analyses for each subbasin. These analyses will provide critical information for determining which habitat, harvest, or passage options might be feasible to accomplish SNAPP objectives for contingency interventions to avoid excessive risk of extinction. SNAPP participants will review development of limiting factors analyses and subbasin plans pertaining to at-risk populations. Information gained will be used in developing contingency options. Any contingency plans developed through SNAPP will need to be updated as limiting factors for population viability are determined and addressed.

Until the Extinction Risk Analyses can be completed and evaluated, it is not known how many populations might be analyzed under Tasks 1.3-1.5. For planning and budgetary purposes, this proposal assumes that 10-12 of the 38 populations identified in Task 1.1 would proceed through Tasks 1.3-1.5. Others would not proceed to further analysis due to a) sufficient population viability, b) insufficient information to estimate or conclude extinction risk, or c) aggregation of populations due to information arising from the extinction risk analyses or other sources, particularly the TRT populations delineations.

A. Develop management alternatives.

The four-step process, as outlined in the 2000 Biological Opinion (NMFS 2000), is aimed at identifying and implementing appropriate artificial propagation, or other strategies for imperiled stocks. For populations determined to be at excessive risk of extinction, appropriate subbasin planners will be notified and requested to submit habitat-based options that could meet the SNAPP goal. These options will be considered along with alternatives developed by SNAPP participants that will focus primarily on artificial propagation strategies. As the goal of the safety-net program is to re-establish and maintain self-sufficient populations when implemented in concert with necessary habitat and passage restoration measures. As such, management alternatives will be considered in the broader context of ongoing habitat and passage modifications/restoration activities.

Methods: SNAPP participants will consider the suite of artificial propagation strategies available (e.g., egg boxes, translocation, kelt reconditioning, captive brood, supplementation etc.). For each management alternative consider: 1) the likelihood of achieving the necessary response (i.e., via projected changes in productivity); 2) the degree of intrusiveness/risk potential, both logistical and biological (e.g., captive brood programs might be considered higher risk than placement of egg boxes); and 3) the amount of time necessary for implementation. SNAPP members will assist in developing alternatives and apply benefit-risk, feasibility, and cost-effectiveness analysis on the alternatives relative to the above selection criteria.

Habitat-based options will be provided by subbasin planners and similarly analyzed.

B. Benefit-Risk Assessment

The SNAPP group intends that populations that undergo Task 1.3.A, Development of Management Alternatives, will then proceed to Task 1.3.B. The Benefit-Risk Analysis (B-RA) is intended to serve four distinct purposes: 1) describe the goals of an intervention program; 2) compare the range of management actions that could achieve the goals; 3) assess the potential risks and benefits of the management actions that could achieve the goals; and 4) identify critical uncertainties to be addressed by research elements of the RM&E plan. Since the goal of SNAPP, as part of a broader effort, is to re-establish or maintain self-sufficient populations, the B-RA will consider artificial propagation as one aspect of a habitat, passage, and natural production equation. To do so, the B-RA will include projections of baseline (status quo) and increased survival and productivity expected to result from actions intended to decrease passage mortality and/or increase habitat quality. Information on the timing of planned improvements in passage and tributary habitat will be critical in assessing the need for and benefits and risks of interventions. For the purposes of this proposal, the B-RA on artificial propagation options will consist of the following:

(1) an analysis of risks to the recipient (target and non-target spawning aggregates) as well as donor stocks (if they differ), from impacts associated with:
    (a) captivity period in a hatchery facility, including:
        1. artificial selection
        2. rearing techniques
        3. proportion of broodstock comprised of hatchery-reared and naturally-spawned adults
    (b) genetic interactions associated with interbreeding, including:
        1. loss of diversity
        2. outbreeding depression, inbreeding depression, and specific dysgenic and adaptation processes
    (c) ecological interactions such as competition, predation, and potential for increased exploitation
    (d) risk associated with no action/comparison of potential risks/benefits from alternate actions

(2) a list of objectives, criteria for evaluation, and an estimated timeframe to achieve objectives

(3) a list of potential benefits expected to result from implementation of the proposed short-term action including:
    (a) conservation/generation of genetic diversity
    (b) conservation/generation of life-history types
    (c) potential to halt or reverse declining abundance
    (d) conservation of culturally and socially important resources
    (e) restoration/conservation of spawning aggregates throughout the range of available habitat

(f) restoration of ecosystem processes
(g) long-term restoration of tributary fisheries for sports and tribal fishing opportunities
(h) normative ecological functions

Given that the results of a B-RA for artificial production options may be less conclusive than desired, SNAPP will assume a "no intervention" outcome as the default decision.

A benefit-risk assessment method will need to be obtained from the literature or developed to evaluate habitat-based options. Whatever method is chosen for this purpose, it will be used to assess the habitat-based options against the same criteria, risks, and benefits as those for artificial propagation alternatives.

1. Gather existing data.

The quality and comprehensiveness of a B-RA will depend primarily on the quality and diversity of available data. Therefore, data requests will be forwarded to all action agencies, TRT, and special interest groups that maintain genetic, life history, habitat, and historical data relevant to each at-risk population. In addition comprehensive gray literature and citation searches will be conducted. The most recent results from experiments in conservation propagation will be reviewed and applied.

Methods: Send a standardized data request to all pertinent agencies and special interest groups that may maintain relevant data. Use Streamnet library resources to conduct gray literature and peer-reviewed literature searches for documents pertinent to each population. Standardize data sets, and summarize peer-reviewed and gray literature.

2. Perform B-RA.

At a minimum the B-RA will address those items listed above. Whenever possible, the B-RA will rely on quantitative estimates of the potential for a risk to occur, and the range of responses should a risk factor be realized. However, for many risk factors (e.g., outbreeding depression), a qualitative assessment of risk may be necessary. In every case, the risks associated with artificial propagation will be compared to the risks associated with no action. Progress of the B-RA will be coordinated in SNAPP.

Methods: For the range of management alternatives being considered, determine whether the risk of artificial selection can be decreased by innovative rearing methods, and/or by altering the proportion of naturally spawned versus hatchery reared adults comprising the brood stock and naturally spawning component of the population. Review TRT work and analyze existing genetic data to determine the scale of population structure, and determine whether or not multiple isolated populations exist within the study area that will be potentially affected by the range of management alternatives considered. Using this information, a qualitative assessment of the risks of homogenization and/or loss of genetic

variability/distinctness will be pursued. Using available life history and presence/absence information quantitatively/qualitatively assess the probability of beneficial/adverse effects resulting from competition, predation, and exploitation, under the suite of management alternatives being considered. Based on the results and projections of the previous analyses, formulate a list of program objectives, a timeframe for completion of those objectives, and criteria for evaluation of the objectives (e.g., within two generations achieve a combined (hatchery plus natural) adult return rate above replacement, measured as lambda (the population growth rate) greater than one). Based on the previous analyses, generate a list of probable benefits and risks that the program may confer to the naturally spawning stock.

The "Artificial Propagation Guidelines and Benefit/Risk Assessment Framework" (2/2001 draft) from the Comprehensive Chinook and Coho planning process in Puget Sound will be used in preparation of the analyses performed on artificial propagation options. An as yet to be determined benefit-risk assessment method will be selected for application to habitat-based options. In these habitat cases, the analysis may focus more on feasibility, cost-effectiveness, and timeliness to avoid demographic risks rather than the genetic risks inherent in production alternatives.

3. Identify research, monitoring, and evaluation (RM&E) components.

Any artificial propagation program will present some degree of risk to the target and/or non-target stocks. Effective RM&E requires development and testing of specific hypotheses. To do so requires baseline data on pre-safety-net population parameters. Therefore, one of the goals of the RM&E component of this proposal is identification of data needs specific to the RM&E activities that will be pursued. Using the results of the B-RA, a list of critical uncertainties and programmatic monitoring objectives will be formulated, and the associated data needs will be identified.

Methods: Using the B-RA, compile a list of data gaps that must be addressed to quantitatively assess programmatic risks (e.g., are data sufficient to confidently determine the existence of fine-scale population structure). Compile a list of monitoring needs to assess success or failure in achieving program objectives (e.g., adult return rates of both hatchery reared and naturally spawned individuals). Determine research priorities (e.g., spawning success of hatchery-reared adults in the natural environment).

C. Review/consultation.

Following the development of management alternatives, a summary of the considered alternatives, and an analysis of the efficacy (benefit/risks, cost-effectiveness, and feasibility) of each alternative will be submitted for co-manager, TRT, and scientific peer review. Given the complex and often

qualitative nature of B-RA's, comments will be aggressively solicited for commentary and critique of the B-RA. Specifically, the entities will be asked to provide commentary regarding: 1) comprehensiveness of analysis techniques/alternate analyses; 2) sufficiency of risk mitigation procedures; 3) objectives, and criteria for assessing program effectiveness; and 4) sufficiency of RM&E components.
Comments and criticisms will be actively solicited as a means to achieve agreement among the co-managers for development of a preferred contingency alternative.

Methods: Distribute a draft analyses of the management alternatives considered, ranking criteria employed, and a prioritized list of management alternatives with a recommended option. Aggressively seek action agency participation in reviewing and providing comments on the prioritized and preferred management alternatives. At a minimum this step will include a series of meetings among SNAPP agencies.

D. Comment inclusion.

All comments and management alternatives provided by the SNAPP group, TRT, and peer review will be analyzed and included in the final draft of the intervention strategies and strategy proposal. We suspect that review will reveal weaknesses of the draft B-RA, and that SNAPP agencies may provide alternate analyses and interpretations of the data. Therefore, we intend to incorporate all comments and alternate interpretations and analyses in the final B-RA. The goal of this task is to present the most comprehensive analysis possible given the constraints of the available data. We recognize that the implementation of any safety-net program will require agreement among fishery co-managers, and it is our hope that this process will achieve the necessary cooperation.

Methods: Include co-manager and peer review comments and management alternatives in the final prioritized list of intervention strategies. Perform alternate analyses. Compile alternate analyses, interpretations, and comments as necessary to complete the final B-RA.

TASK 1.4 Development of Contingency Hatchery and Genetic Management Plans (CHGMP)

The CHGMP summarizes program specific information from the B-RA and the components of RM&E associated with an artificial propagation program. In practice, the CHGMP defines, in detail, all program specific objectives and associated tasks, specific management actions, and a description of how the success and/or failure of the management actions will be assessed. The CHGMP is required for a Section 10 permit for take of a listed species for hatchery production. Each CHGMP will be developed in collaboration with SNAPP participants. Completion of CHGMPs requires at least a conceptual understanding of how existing production facilities would be modified or expanded to integrate a new conservation program, or where new facilities would be required. This will require considerable coordination with SNAPP participants. A CHGMP will only be prepared if the prior benefit/risk assessment indicates a net benefit

to the population from the proposed intervention. Each CHGMP will include triggers based on the ERA and B-RA that will guide managers on when an emergency intervention should be reviewed for implementation. The plans will also include specific rules for when an emergency intervention program should end.

A. CHGMP template completion.

The HGMP template will be supplemented with biological triggers that would be used to initiate a regional review and decision process to implement a safety net project. The CHGMP will also include an exit strategy providing the criteria for ending the intervention program.

Methods: Download and complete the NMFS HGMP template (http://www.nwr.noaa.gov/1hgmp/hgmptmpl.htm).

B. Following the completion of the CHGMP template, a draft will be submitted to the SNAPP agencies.

Methods: Distribute the draft CHGMP to the SNAPP agencies and for scientific review. Aggressively seek agency and scientific peer participation in reviewing and providing comments on the CHGMP. At a minimum this step will include a conference call among action agencies.

C. Comment inclusion.

All comments provided by the fishery agencies and scientific peer review will be addressed and included in the final draft of the C HGMP.

This proposal ends with the development of CHGMPs. These contingency plans will need to be maintained and modified as new information becomes available on population viability, artificial propagation, and progress in habitat rehabilitation. A decision to implement a CHGMP will not be made by SNAPP, but by NMFS, the Action Agencies, and the Northwest Power Planning Council through their regional decision-making processes, including scientific review. These processes will include the Council's 3-Step Process, NEPA, and NMFS' ESA regulatory processes.

g. Facilities and equipment

The only equipment need anticipated for this project is a laptop computer that will be dedicated to use for this project.

h. References

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Section 10 of 10. Key personnel

Personnel from several agencies will be involved in undertaking the four steps outlined in SNAPP.

Sharon Kiefer, IDFG, will coordinate the collection of existing population information from the Department for use in the Extinction Risk Analyses. Ms. Kiefer will also represent IDFG in the SNAPP coordination process, including review and commenting on draft SNAPP products.

Stephen Smith, consultant, will continue to coordinate and facilitate SNAPP under an existing BPA contract. He will assist in collecting existing population information from various agency, tribal, and academic sources for use in the Extinction Risk Analyses. He will also assist fishery managers with Step 2, Development of Propagation Options for any populations deemed at excessive risk of extinction. He will also assist the primary investigators in obtaining review and comments on all draft products.

Herbert Pollard, NMFS, Joe Krakker, USFWS, and Jeff Gislason, BPA, will continue to serve on the SNAPP Core Oversight Team to guide and oversee SNAPP, coordinate its activities within their respective agencies, and review and comment on draft products.

Jay Hesse, NPT, will coordinate the collection of existing population information from the Tribe for use in the Extinction Risk Analyses. Mr. Hesse will also represent NPT in the SNAPP coordination process and review and comment on draft products.

Bill Arnsberg and Chris Beasley will be the primary investigators for Task 1b, Middle Fork Salmon River Population Structure. They will be assisted by CRITFC staff.

Keith Kutchins, SBT, will coordinate the collection of existing population information from the Tribe for use in the Extinction Risk Analyses. Mr. Kutchins will also represent SBT in the SNAPP coordination process and review and comment on draft products.

The Step 1, Extinction Risk Analyses, will be conducted by employees of The Columbia River Inter-Tribal Fish Commission working in the TRT Viability Subgroup. The primary investigator is Chris Beasley, assisted by Rishi Sharma. Resumes for these

individuals are attached in the following pages. The following table lists the titles, FTE's, and expected contribution of these individuals.

Investigator	Title	FTE (weeks)	Contribution
Chris Beasley	Fisheries Scientist	18	Risk analysis and HGMP expertise.
Rishi Sharma	Biometrician	8	Statistical data analysis and simulation.