MEMO

To: Technical Management Team
From: NMFS
Date: January 9, 2002
Subject: Chum Spawning Considerations

This memo is in response to a request from the Implementation Team (IT) for NMFS to prepare a list of factors and our decision process that led us to the chum spawning operation for the 2001 fall season. The IT directive followed a request from the Technical Management Team (TMT) for the IT to clarify which team (TMT or IT) should develop criteria that would be used if conditions were to deteriorate and a determination of de-watering existing redds was necessary. The specific question of whether chum de-watering criteria should be developed, and by which team, was not addressed. Instead, the IT request came after extensive discussion of chum spawning considerations. NMFS considered a number of factors in making its weekly recommendation during this year's chum spawning season and would consider a number of factors if it were faced with a dewatering decision.

The general approach taken by NMFS in its 2000 FCRPS Biological Opinion is to be conservative in the quantity of water used to support the chum spawning operation. The rationale being, chum spawn at a time when little information exists regarding the coming year's water supply. Also, the length of time that flows need to be maintained to support established redds through emergence can be as long as six months. Since many actions in the RPA are based on reservoirs being as full as possible in the spring, a conservative use of water for the chum provides a higher level of assurance that other RPA actions will be implemented. By being conservative at the onset of spawning, the likelihood of having to make a dewatering decision is reduced.

There were several factors unique to the year 2001 which influenced this year's decision process. These included the following issues:

- A refill analysis which indicated initiating the chum operation at a 125 kcfs level in early November would result in lower than an 85% probability of achieving April 10 flood control elevation at Grand Coulee as specified in NMFS' 2000 FCRPS Opinion. The Opinion specifies the initiation of chum spawning flows should not affect implementation of other RPA actions which include refill probabilities of FCRPS storage project and spring and summer flow objectives.

- A recognition that November rains resulted in high discharge from Hardy and Hamilton creeks which were providing spawning habitat for chum. Also, the discharge from Hamilton Creek was inundating much of the mainstem Columbia River spawning habitat similar to what was observed in prior years with a Bonneville Dam discharge of 125 kcfs.
- A recognition that chum were spawning in areas previously not described. The BiOp's specification for the Columbia River to provide a minimum 125 kcfs discharge below

Bonneville Dam was based on observations of habitat used by mainstem chum spawners. At that time, habitat was believed to be limited to the Ives Island area, which required a Bonneville Dam flow of 125 - 160 kcfs to become usable. During the late fall and winter of 2000 and 2001, chum have been observed spawning in mainstem areas near I-205 (Woods Seeps and Rivershore development), which is habitat less restricted by mainstem flow levels.

- A desire for the chum spawning operation to not conflict with the Vernita Bar agreement. NMFS' 2000 Opinion specifies that a mainstem chum operation cannot adversely affect implementation of the parties' ability to comply with the Vernita Bar agreement. This year, due to the extremely low natural stream flows during October and early November, the initiation of a chum spawning operation would have exceeded the targeted flow level agreed upon by parties to the Vernita Bar agreement. NMFS, BPA, several tribes, and the states of Oregon and Washington are among the signatories to this agreement.

- Based on the lessons learned from 2000 and 2001, the Bonneville tailwater gauge level can be used for management purposes instead of a fixed flow. Use of the Bonneville tailwater gauge better reflects the influence of the Willamette River, tides, and local stream flow on the available spawning habitat below Bonneville Dam than managing to a fixed discharge. A linear regression of the data collected over the past several years between flow and tailwater elevation resulted in an excellent fit (R^2 =.97). This analysis indicated a flow of 125 kcfs was equivalent to a tailwater elevation of approximately 11.5 ft.

There are several other factors relevant to the chum population which indicate they are at a lower risk than other listed anadromous stocks covered by NMFS' FCRPS 2000 Opinion. These include:

- NMFS estimated median population growth rate (lambda) over a base period of the Columbia River chum ESU (including the Grays River system, Hardy and Hamilton Creeks, and Hamilton Springs) during development of its 2000 Opinion to be 1.04. A lambda of 1 indicates a stable population trend. NMFS' management interpretation of this is reflected in the Opinion's specification that the chum operation should not come at the expense of the RPA's water management operation for other theatened and endangered ESUs for which median population growth rates actually declined over the base period.

- The geographic distribution of the chum salmon ESU. Genetic Stock Identification studies by WDFW indicate that this ESU is comprised of two distinct population segments, the Grays River chum and the chum which spawn in the mainstem and tributary creeks below Bonneville Dam as far as I-205 bridge. Results of WDFW's analysis indicate that the chum spawning in the mainstem Columbia/Ives Island complex are part of the same population as the chum spawning in Hamilton and Hardy creeks.

- Adherence to a chum operation that is consistent with the conservative direction provided in NMFS' 2000 Biological Opinion. The BiOp specifies that a chum spawning operation

should only be initiated if it is believed the operation can be maintained from the initiation of spawning through emergence. Data collection in 2001 indicate the chum operation necessitates a flow operation being sustained for nearly six months. A lower flow level has a much higher probability of being sustained than a higher flow level with less of an impact on FCRPS refill probabilities and spring and summer flow augmentation programs for threatened endangered Snake River and Upper Columbia river ESUs .

While a conservative approach to managing the quantity of water used during spawning reduces the risk of having to make a dewatering decision, it does not eliminate dewatering as a possibility. However, the development of a priori criteria for making a dewatering decision is not appropriate. The basis for a dewatering decision would depend greatly on in-season conditions. These types of decisions are best made by the TMT process because of their focus on real time conditions. Factors that should be considered in making a dewatering decision include:

- The number and percentage of the total redds which would be affected by the decision
- The percentage of the total chum population that spawned in the creeks
- The percentage of the total chum population that spawned at other locations
- The component of the overall population that these redds represent
- Status of the FCRPS reservoir elevations
- Expected benefit to reservoir levels and river operations which would be provided by the dewatering decision
- Precipitation and runoff forecasts
- Expected river operations due to power market environment
- Status of the upriver listed stocks
- Existence and status of a brood contingency plan