UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

April 4, 2002

Frank L. Cassidy, Jr.
Chairman, Northwest Power Planning Council
851 SW Sixth Avenue, Suite 1100
Portland, OR 97204

Re: Interim Abundance and Productivity Targets for Interior Columbia Basin Salmon and Steelhead Listed under the Endangered Species Act (ESA)

Dear Mr. Cassidy,

As promised in my February 20, 2002 letter to you, enclosed are interim abundance and productivity targets for ESA listed salmon and steelhead in the Interior Columbia Basin. The National Marine Fisheries Service (NMFS) provides these to the Council, and by copy of this letter to the states, tribes and Federal agencies, to provide a preliminary and general sense of the ESA recovery objectives currently under development. These interim targets are only a starting point. NMFS will replace these targets with scientifically more rigorous and comprehensive recovery goals using viability criteria developed through the Interior Columbia Technical Recovery Team (TRT) process that commenced in October, 2001.

NMFS established the Interior Columbia TRT to develop specific population identification, characterization, and viability criteria for Interior Basin salmon and steelhead. The TRT will also characterize the relationship between the populations and their habitat and will provide specific analyses of the factors for decline (or limiting factors) for each population. The TRT will work with local experts, particularly tribal, state and federal biologists, to ensure that the most current and accurate technical information is used in developing their products. The TRT's draft recommendations for delisting criteria should be available by late 2002, with the remaining products completed by late 2003.

The TRT's efforts will provide the technical foundation and context for recovery planning. From this foundation, policy choices about recovery goals and actions can be made and recovery plans can be prepared. NMFS' recovery plan guidance for West Coast Salmon (www.nwfsc.org) refers to the TRT efforts as Phase One, and these policy tasks as Phase Two. One of our critical next steps is to work with the Council, states, tribes and stakeholders to determine how best to implement Phase Two in the Interior Columbia. It is clear that Phase Two must be part of, or at least fully coordinated with, subbasin and watershed planning and Recovery Board efforts already underway.

It is important to note that these interim abundance and productivity targets make no particular assumptions regarding harvest or any other take of listed ESUs. These are intended to represent the number and productivity of naturally-produced spawners that may be needed for recovery, in the context of whatever take or mortality is occurring. NMFS intends that final recovery goals developed in Phase Two will include harvest sufficient to meet our treaty and trust responsibilities and fulfill our mission of sustainable fisheries. These final "broader-sense" recovery goals should provide for healthy populations to meet society's needs.

The enclosure provides the interim abundance and productivity targets and an overview of how they were developed. These abundance and productivity targets for a given spawning aggregation or index area should not be considered in isolation, as they represent the values that, taken together, may be needed for the population to be self-sustaining in its natural ecosystem. It is worth clarifying that these interim targets are not the result of efforts by the Interior Columbia TRT nor the Northwest Fisheries Science Center, although they are based on scientific documents to which our Science Center and co-managers contributed. These are simply NMFS' best early guidance based on existing information.

Sincerely,

Bob Lohn

Bob Lohn

Cc: CBFWA members
Louise Solliday – OR Governor's Office
Neal Coenen – OR Governor's Office
Curt Smitch – WA Governor's Office
Jim Caswell – Idaho Office of Species Conservation
Deborah Marriott – Lower Columbia River Estuary Partnership
Dennis Rohr – Upper Columbia Fish Recovery Board
Jeff Breckel – Lower Columbia Fish Recovery Board

enclosure

Enclosure

Interim Abundance and Productivity Targets for Pacific Salmon and Steelhead Listed under the Endangered Species Act in the Interior Columbia Basin

These interim abundance and productivity targets are provided for geographic spawning aggregations of naturally produced spawning adults. They address the portion of each evolutionarily significant unit's (ESU's) historical range below the major mainstem dams that do not provide for fish passage (e.g., Chief Joseph Dam on the upper Columbia, Hells Canyon Dam on the Snake mainstem and Dworshak Dam on the north fork Clearwater River). The potential role of geographic spawning aggregations above these dams in the ESU's viability as a whole will be evaluated through the formal recovery planning process guided by recommendations from the Interior Columbia Technical Recovery Team (Interior TRT).

It is important to note that these interim targets are not in the context of the whole ESUs, rather they are defined for tentative geographic spawning aggregations within the ESUs. The Interior TRT will develop more accurate population definitions to replace these preliminarily defined spawning aggregations. The TRT will also generate alternative delisting scenarios – different combinations of viable salmonid populations that would each provide for the recovery of the ESU as a whole.

Existing Delisting Objectives – Snake River spring/summer chinook, Snake River sockeye, Upper Columbia spring chinook and Upper Columbia steelhead

Recommended recovery objectives have been developed for Snake River spring/summer chinook spawning aggregations, Snake River fall chinook and Snake River sockeye by the Snake River Recovery Team (Bevan et al., 1994). Those recommendations were modified to apply to index stock areas[1] based on recommendations from the IDFG v NMFS Biological Requirements Workgroup (BRWG, 1994) and were incorporated into the 1995 Proposed Snake River Recovery Plan (NMFS, 1995). The targets were further modified based on input from the Idaho Department of Fish and Game and were included in another draft recovery plan for Snake River Salmon (NMFS, 1997). Population definitions and recommended abundance and productivity objectives have also been developed for upper Columbia spring chinook and steelhead ESU spawning aggregations in the Methow, Entiat, and Wenatchee through the QAR (Quantitiative Analytical Report) process (Ford et al., 2001). Ford et al. (2001) did not identify an abundance goal for the Okanogan due to a lack of sufficient historical information. However, the potential for naturally spawning aggregations in this area will be evaluated by the Interior TRT. Tables 1(a) and 1(b) summarize those specific recommendations for interim targets for listed chinook and sockeye stocks in the upper Columbia and Snake River basins. Productivity criteria for Snake River sockeye were developed in the 2000 FCRPS BiOp (NMFS, 2000) for a 40-48 year time period, recognizing the time required to institute habitat rehabilitation options and the time

[1]The index area recovery objectives were developed for use in assessing the status of Snake River spring chinook stocks. Index areas have established time-series of scientific observations (e.g., redd counts), and are generally smaller in scale than geographic spawning aggregations. Objectives for these specific index areas have played a key role in the recent series of Federal Hydropower system Biological Opinions (e.g., NMFS, 2000; see section 1.3.1). Index area recovery objectives are included in Table 1(a).

lag of response in the sockeye populations. However, to be consistent with the targets provided for the other ESUs, the productivity targets given for Snake River sockeye in Table 1(b) represent only a general biological rule of thumb over a time period of 8 years.

New Delisting Objectives – Interior Columbia Steelhead and Middle Columbia Steelhead ESU

Population definitions, abundance and productivity targets for Snake River and Middle Columbia steelhead have not been formally developed. For these ESUs, geographic spawning aggregations and interim abundance targets are based upon the QAR approach used in the Upper Columbia Biological Requirements Report (Ford et al., 2001), and from: descriptions in the 1990 Subbasin Plans; recommendations from state level stock surveys (e.g., ODFW, 1995; WDFW, 1993; IDFG, 1985); NMFS' Proposed Recovery Plan for Snake River Salmon (NMFS, 1995); the 2000 Biological Opinion on the operation of the Federal Columbia River Power System (FCRPS BiOp) (NMFS, 2000); and Oregon Department of Fish and Wildlife reports regarding conservation assessments (Chilcote, 2001; ODFW, 1995). Table 2 lists possible interim abundance targets and interim productivity objectives for major steelhead spawning aggregations in the Upper Columbia, the Middle Columbia and the Snake River ESUs. The abundance values listed for the Wenatchee, Entiat and Methow subbasins are the levels recommended through the QAR process (Ford et al., 2001). Productivity criteria for Snake River and mid-Columbia steelhead were developed in the 2000 FCRPS BiOp (NMFS, 2000) for a 40-48 year time period, recognizing the time required to institute habitat rehabilitation options and the time lag of response in the steelhead populations. However, to be consistent with the targets provided for the other ESUs, the productivity targets given for Snake River and mid-Columbia steelhead in Table 2 represent only a general biological rule of thumb over a time period of 8 years.

Interim Targets – Description and Discussion of Caveats

Interim Abundance Targets

The enclosed Tables provide interim abundance targets generally representing the geometric mean of spawner escapement over time scales of eight years or approximately two generations. A challenge for co-managers, in the context of these interim abundance targets, is how to measure their progress toward recovery. Uncertainties associated with estimates of abundance and population trends must be considered when determining whether a population's recovery abundance goal has been met. These issues will need to be addressed in formal recovery planning.

Interim Productivity Objectives

In the long-term, a viable population will be characterized by a natural replacement rate (population growth rate) that fluctuates due to natural variability around an average of 1.0, but at an abundance high enough to provide a low risk of extinction. In many cases, spawner abundances are currently far below the levels required to minimize longer term risks of extinction. In those cases, average growth rates for spawner aggregations must exceed a 1:1 replacement rate until viable population abundance levels are achieved. These interim productivity and abundance targets should not be considered in isolation. A replacement rate ≥ 1 is indicative of a healthy population only if the abundance target has been achieved as well.

However, a measure of the growth rate during the rebuilding/recovery phase may be most informative to subbasin planning groups in the near term, as population growth parameters are more reliably quantified than are abundance parameters. The enclosed Tables include recommendations of productivity objectives utilizing the above rules of thumb, as well as recommendations from the FCRPS BiOp (NMFS, 2000), the QAR (Ford et al., 2001), and the Proposed Snake River Recovery Plan (NMFS, 1995).

Interim Spatial Structure and Diversity Objectives

The provided interim abundance and productivity targets are just a start, and do not provide a comprehensive index of healthy populations. Typically, a recovered ESU would have healthy populations representative of all the major life history types, and of all the major ecological and geographic areas within an ESU. In the absence of specific diversity data about populations, conservation of habitat diversity might be used as a reasonable interim proxy. More specifically, the QAR Biological Requirements Report (Ford et al., 2001) developed the following objective for upper Columbia River populations: "In order to be considered completely recovered, spring chinook (and steelhead) populations should be able to utilize properly functioning habitat in multiple spawning streams within each major tributary, with patterns of straying among these areas free from human caused disruptions." Furthermore, the FCRPS BiOp (NMFS 2000) states that "... currently defined populations should be maintained to ensure adequate genetic and life history diversity as well as the spatial distribution of populations within each ESU." NMFS recommends that these approaches be utilized in early Interior Columbia subbasin planning efforts.

Table 1(a). Interim Objectives – Listed Snake River and Upper Columbia Chinook ESUs[2]

Geographic Spawning Aggregations		Interim Abundance Targets [3]		Interim Productivity Objectives
ESU/Spawning Aggregation	Index Areas	Spawning Aggregation	Index Areas	
Upper Col. Spring Chinook ESU				Upper Col. Spring chinook populations are currently well below recovery levels. The geometric mean[4] Natural Replacement Rate (NRR) will therefore need to be greater than 1.0 (QAR recommendations; Ford et al., 2001)
Methow	Methow	2000	2000	
Entiat	Entiat	500	500	
Okanogan		--[5]		
Wenatchee	Wenatchee	3750	3750	
Snake River Spring/Summer Chinook ESU				"For delisting to be considered, the eight year (approximately two generation) geometric mean cohort replacement rate of a listed species must exceed 1.0 during the eight years immediately prior to delisting. For spring/summer chinook salmon, this goal must be met for 80% of the index areas available for natural cohort replacement rate estimation." (Proposed Snake River Recovery Plan; NMFS, 1995)
Tucannon River		1000		
Grande Ronde River		2000		
	Minam		439	
Imnaha		2500		
	Mainstem		802	
Lower Mainstem tributaries		1000		
Little Salmon River Basin		1800		
Mainstem Salmon small trib's		700		
South Fork Salmon (Sum.)		9200		
	Johnson Cr.		288	

[2]These interim targets are derived from: Bevan et al., 1994; BRWG, 1995; NMFS, 1995; and NMFS, 1997.

[3]Eight year, or approx. 2 generations, geometric mean of annual natural spawners. Abundance targets are also provided for smaller scale "Index Areas".

[4]Using the geometric mean as opposed to the arithmetic mean is a common practice when dealing with data series with inherently high annual variability. In the Columbia basin, the geometric mean has been used as a standard measure in the series of Biological Opinions issued covering the Federal Columbia River Power system (e.g., NMFS, 2000, section 1.3) and in the upper Columbia QAR.

[5]Ford et al. (2001) did not identify an abundance goal for the Okanogan due to a lack of sufficient historical information. However, the potential for naturally spawning aggregations in this area will be evaluated by the Interior TRT.

Table 1(a) *continued.* Interim Objectives – Listed Snake River and Upper Columbia Chinook ESUs

Geographic Spawning Aggregations		Interim Abundance Targets		Interim Productivity Objectives
***ESU*/Spawning Aggregation**	**Index Areas**	**Spawning Aggregation**	**Index Areas**	
Snake River Spring/Summer Chinook ESU (cont.)				*(see above)*
Middle Fork Salmon River		9300		
	Bear Valley/Elk		911	
	Marsh Cr.		426	
Mainstem Tributaries (Middle Fk. to Lemhi)		700		
Lemhi River		2200		
Pahsimeroi (Sum.)		1300		
Mainstem Tributaries (Sum.) Lemhi to Redfish Lake Cr.		2000		
Mainstem Tributaries (Spr.) Lemhi to Yankee Fork		2400		
Upper East Fork Trib's (Spr.)		700		
Upper Salmon Basin (Spr.)		5100		

Table 1(b). Interim Objectives – Snake River Fall Chinook and Sockeye ESUs

ESU	**Interim Abundance Targets**[6,7]	**Interim Productivity Objectives**
Snake River Fall Chinook ESU	2500	"For delisting to be considered, the eight year (approximately two generation) geometric mean cohort replacement rate of a listed species must exceed 1.0 during the eight years immediately prior to delisting. For spring/summer chinook salmon, this goal must be met for 80% of the index areas available for natural cohort replacement rate estimation." (Proposed Snake River Recovery Plan; NMFS, 1995)
Snake River Sockeye ESU	1000 spawners in one lake; 500 spawners per year in a second lake.	The Snake River sockeye ESU is currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0. [8]

[6]These interim targets are derived from the Snake River Recovery Team recommendations included in the 1995 Proposed Snake River Recovery Plan (NMFS, 1995).

[7]Eight year, or approx. 2 generations, geometric mean of annual natural spawners in the mainstem Snake River

[8]The 2000 FCRPS BiOp provided a productivity objective for Snake River sockeye, Snake River and Middle Columbia steelhead populations of "a median annual population growth rate (lambda) greater than 1.0 over a 40-48 year period." (NMFS, 2000).

Table 2(a). Interim Objectives – Snake River Steelhead ESU[9]

ESU/Spawning Aggregations	Interim Abundance Targets[10]	Interim Productivity Objectives
Snake River Steelhead ESU		Snake River ESU steelhead populations are currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0. [8]
Tucannon R.	1300	
Asotin Cr.	400	
Grande Ronde		
Lower Gr. Ronde	2600	
Joseph Cr.	1400	
Middle Fork	2000	
Upper Mainstem	4000	
Imnaha	2700	
Clearwater River		
Mainstem	4900	
South Fork	3400	
Middle Fork	1700	
Selway R.	4900	
Lochsa R.	2800	
Salmon River		
Lower Salmon	1700	
Little Salmon	1400	
South Fork	4000	
Middle Fork	7400	
Upper Salmon	4700	
Lemhi	1600	
Pahsimeroi	800	

[9]These interim targets are derived from: Ford et al., 2001; Chilcote, 2001; NMFS, 1995; ODFW, 1995; WDFW, 1993; and IDFG, 1985.

[10]Eight year, or approx. 2 generations, geometric mean of annual natural spawners.

Table 2(b). Interim Objectives – Upper & Middle Columbia River Steelhead ESUs[11]

ESU/ Spawning Aggregations	Interim Abundance Targets[12]	Interim Productivity Objectives
Upper Columbia Steelhead ESU		
Methow R.	2500	Geometric mean Natural Return Rate (NRR) should be 1.0 or greater over a sufficient number of years to achieve a desired level of statistical power. (QAR recommendations; Ford et al., 2001)
Entiat R.	500	
Okanogan R.	__ [13]	
Wenatchee R	2500	
Middle Columbia Steelhead ESU		
Yakima River		Middle Columbia ESU steelhead populations are currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0. [8]
Satus/Toppenish	2400	
Naches	3400	
Mainstem (Wapato to Roza)	1800	
Mainstem (above Roza)	2900 [14]	
Klickitat	3600	
Walla-Walla	2600	
Umatilla	2300	
Deschutes (Below Pelton Dam complex)	6300	
John Day		
North Fork	2700	
Middle Fork	1300	
South Fork	600	
Lower John Day	3200	
Upper John Day	2000	

[11]These interim targets are derived from: Ford et al., 2001; and NMFS, 2000.

[12]Eight year, or approx. 2 generations, geometric mean of annual natural spawners

[13]Ford et al. (2001) did not identify an abundance goal for the Okanogan due to a lack of sufficient historical information. However, the potential for naturally spawning aggregations in this area will be evaluated by the Interior TRT.

[14]NWPPC smolt capacity reduced by 50% to reflect shared production potential with resident form.

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