

**PETITION TO LIST PUGET SOUND WINTER RUN CHUM SALMON  
(*ONCORHYNCHUS KETA*) IN THE NISQUALLY RIVER SYSTEM AND CHAMBERS  
CREEK AS AN ENDANGERED OR THREATENED SPECIES UNDER THE  
ENDANGERED SPECIES ACT (ESA)**

TO: SECRETARY OF COMMERCE, UNITED STATES DEPARTMENT OF COMMERCE,  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE  
FISHERIES SERVICE

From: Sam Wright (Petitioner), 1522 Evanston Ct., NE, Olympia, Washington, 98506 ([360-943-4424](tel:360-943-4424), [sam.wright@att.net](mailto:sam.wright@att.net)). Petitioner is a Fisheries Research Scientist with five decades experience in managing fish populations and fish habitat.

Subject: Petition the Secretary of Commerce to list as Endangered or Threatened the Puget Sound winter run populations of chum salmon (*Oncorhynchus keta*) in the Nisqually River system and Chambers Creek and to designate critical habitat.

These same populations were previously evaluated for possible ESA listing in the following December 1997 report: Johnson, O.W., W.S. Grant, R.G. Cope, K. Neely, F.W. Waknitz, and R.S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-NMFSC-32, 280 p.

The report, herein defined as Johnson et al. (1997), in the Executive Summary, makes the following statement about Puget Sound winter run chum salmon: "The Puget Sound/Strait of Georgia ESU encompasses a great deal of diversity in chum salmon life-history patterns, including summer, fall, and winter runs. Only two populations of winter-run chum salmon were identified throughout the worldwide range of chum salmon, both of which are present in this ESU and spawn within a few miles of each other in southern Puget Sound. These winter-run populations are not large in size, and although they appear to be healthy with stable escapements, they represent a life-history pattern which is important to conserve."

Johnson et al. (1997:5) list the following questions which must be answered in determining whether listing under ESA is justified:

1. Is the entity in question a "species" as defined by the ESA?
2. If so, is the "species" threatened or endangered?

Johnson et al. (1997-5,6) then state that "An ESU is defined as a population that 1) is substantially reproductively isolated from nonspecific populations and 2) represents an important component of the evolutionary legacy of the species.

The term "evolutionary legacy" is used in the sense of "inheritance" – that is, something received from the past and carried forward into the future. Specifically, the evolutionary legacy of a species is the genetic variability that is a product of past evolutionary events and that represents the reservoir upon which future evolutionary potential depends. Conservation of these genetic resources should help to insure that the dynamic process of evolution will not be unduly constrained in the future."

As the only two winter-run populations of chum salmon in the entire worldwide range of the species, the populations in the Nisqually River system and Chambers Creek clearly meet the

above definition. In addition, current terms like "global warming" and "climate change" did not even exist in older resource assessment reports such as Johnson et al. (1997).

Pertinent Information from Johnson et al. (1997)

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In Washington, chum salmon are managed jointly by the WDFW (formerly the Washington Department of Fisheries (WDF) and the Washington Department of Wildlife (WDW) and the WWTIT. A variety of seasonal runs are recognized, including summer, fall, and winter populations. Fall-run fish predominate, but summer runs are found in Hood Canal, the Strait of Juan de Fuca, and in southern Puget Sound (WDF et al. 1993). Only two rivers have fish returning so late in the season that the fish are designated as winter-run fish and both of these are in southern Puget Sound.

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Chambers Creek, a southern Puget Sound stream that empties into the Tacoma Narrows, also once contained a run of summer fish (WDF et al. 1993). The existence of the run was inferred from weir counts in the 1970s and 1980s at the Garrison Creek Hatchery, which is located on a tributary of Chambers Creek. Hood Canal chum salmon with November return timing were introduced into Chambers Creek in the 1970s. Until the SASSI review, chum salmon returning to Chambers Creek before 10 December were assumed to be a mix of the "early native stock" and introduced fish (Crawford 1997); fish returning after 10 December were considered natural winter-run chum salmon. However, analysis of weir counts at the hatchery revealed an earlier run beginning about the third week in September and peaking about the third week in October. The early run was considered to be extinct by about 1983 when only three fish were observed in the creek. November-returning fish of Hood Canal origin have not been observed in Chambers Creek since 1986, but winter-run chum salmon still return to the creek (see below).

The Chamber Creek winter-run fish enter the river from early December to late January (Table 4) and are reported in SASSI to be geographically and temporally isolated from other Puget Sound runs (WDF et al. 1993). As reported by Crawford (1997:5), "The issue of spawner overlap with winter chum is moot, since summer and 'fall' chum are no longer present."

Winter-run chum salmon (defined in the SASSI report (WDF et al. 1993) as fish with an average peak of spawning after 10 January) also occur in the Nisqually River in southern Puget Sound (Table 4) (WDF et al. 1993). This winter run and the winter run in Chambers Creek may be the latest returning chum salmon in the world. Tagged chum salmon caught by purse seines in the Nisqually River estuary between late November and mid-January from 1974 to 1980 were recaptured from mid-December to late February/early March at weirs on two spawning ground tributaries, Muck and Yelm Creeks (Cole et al. 1986). Small numbers of fall-timed chum salmon are caught in a tribal fishery in the Nisqually River basin, but WDFW does not believe these fish represent a self-sustainable fall run (Turner 1995). Stream surveys or other data for these fall fish are not available. These fall fish may be strays or they may be from hatchery programs in the Nisqually River Basin. These hatchery programs have primarily reared winter-run fish, but summer-run fish from Johns Creek and fall-run fish from Kennedy Creek, Hood Canal, and Bonneville Hatchery Complex on the Columbia River have also been propagated (see Appendix).

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In the BRT's review of chum salmon life-history traits, only run timing appeared to be important in defining ESU's, especially for populations of summer-run and winter-run chum salmon, which show unusual run timings.

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Samples from two southern Puget Sound winter-run populations were included in the study, and these two samples were genetic outliers that were most closely related to samples of fall-run Hood Canal and northern Puget Sound populations (Fig. 12).

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Reproductive isolation of the Nisqually River and Chambers Creek winter-run populations, which are the only populations in the ESU whose spawning continues past January, may be somewhat stronger.

The Nisqually and Puyallup Rivers are also unique in southern Puget Sound because their headwaters are fed by glaciers on Mount Rainier, giving the rivers different characteristics than other regional river systems. The Nisqually population is also one of the more genetically distinctive chum salmon populations in Puget Sound. However, these genetic differences are not large in an absolute sense, and a majority of the BRT felt that the distinctiveness of the winter-run populations was not sufficient to designate these populations a separate ESU. Rather, the team concluded that these populations, along with the summer-run populations in southern Puget Sound, reflect patterns of diversity within a relatively large and complex ESU.

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There has been no artificial propagation of Nisqually River winter-run chum salmon, although substantial numbers of hatchery fall-run chum salmon have been planted into the Nisqually River (Table 15, Appendix) to support and enhance commercial fisheries in the area. Based upon timing of adult returns and genetic analysis, these outplants have apparently not affected native winter-run chum salmon in the river (WDF et al. 1993).

Winter-run chum salmon were propagated between 1982 and 1993 in Chambers Creek at the WDFW Garrison Springs Hatchery (Table 14; see no. 22 in Figure 20) and have been released into Chambers Creek at the site of the hatchery, as well as into Clarks Creek and other tributaries of the Puyallup River (WDF et al. 1993) (Appendix).

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The winter-run life history is represented by only two stocks. The Chambers Creek stock is increasing in abundance, and the Nisqually River stock is a relatively large run with a 5-year geometric mean escapement of more than 16,000 spawners. Both stocks are classified as wild production.

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The BRT was also concerned that although the Nisqually River winter-run population is fairly large and apparently stable, the Chambers Creek population is much smaller and spawns in a restricted area. Conservation of populations with all three recognized run-timing characteristics is important to maintain diversity within this ESU.

#### Current Status of the Resource

The attached quantitative measures of the resource were provided by Aaron Dufault of the Washington Department of Fish and Wildlife, who is responsible for management of pink, chum and sockeye salmon resources.

The winter-run chum salmon resource in Chambers Creek declined markedly in recent years and has not even been enumerated since 2009. It has also diverged from the much more favorable abundance trend of fall-run chum salmon in southern Puget Sound. While the latter is indeed unfortunate, it is also compelling new evidence that further justifies the creation of a separate ESU for winter-run chum salmon. The winter-run resource now reacts very differently than fall-run fish to present day environmental conditions. Chambers Creek also had a summer-run chum salmon resource at one time but this has been extinct for many years.

The Nisqually River now has the last remaining viable winter-run resource in the entire range of the species. This is a very high risk situation, especially for a resource that has not achieved its spawning escapement objective in three of the most recent five years of record (2009, 2012 and 2013).

## Puget Sound Winter Chum Salmon Runsize and Escapement Estimates

Year	Total Winter Chum Runsize	Escapement		
		Nisqually R.	Misc. 13B Streams	Chambers (13C)
1968	48,181	27,000	393	160
1969	35,125	19,700	239	353
1970	49,444	32,500	900	668
1971	22,299	8,500	1,002	435
1972	59,919	31,500	1,362	1,526
1973	54,869	27,500	1,217	1,108
1974	61,142	32,114	1,122	1,440
1975	14,724	8,942	702	292
1976	54,217	21,012	1,254	1,045
1977	53,439	21,726	769	1,095
1978	55,414	23,979	5,457	172
1979	28,941	21,720	425	468
1980	73,010	38,083	693	2,239
1981	51,664	28,914	726	1,686
1982	51,133	25,773	1,596	3,204
1983	27,809	12,171	225	1,617
1984	64,398	25,949	1,490	6,287
1985	55,462	21,195	1,001	3,872
1986	44,431	18,986	420	2,420
1987	129,637	70,002	1,640	2,348
1988	94,231	35,893	1,540	5,248
1989	70,824	25,213	1,094	1,878
1990	60,299	11,167	3,079	1,744
1991	38,893	28,325	635	1,767
1992	26,989	5,282	722	2,089
1993	44,940	15,501	1,602	5,802
1994	101,191	64,065	1,415	7,471
1995	42,364	14,106	1,584	7,679
1996	38,476	17,209	669	2,122
1997	10,487	6,423	271	677
1998	82,864	66,940	1,533	2,260
1999	16,996	13,194	808	130
2000	10,894	4,252	514	323
2001	152,675	122,744	2,546	2,821
2002	219,140	183,932	2,342	1,725
2003	39,761	35,885	224	589
2004	112,057	72,366	1,528	2,740
2005	65,485	34,244	1,259	1,256
2006	64,429	45,479	1,299	614
2007	96,247	60,164	718	2,874
2008	84,708	38,043	1,443	1,353
2009	32,044	11,622	531	NA
2010	87,442	64,176	748	NA
2011	104,132	57,309	1,225	NA
2012	21,660	14,806	318	NA
2013	29,545	16,460	403	NA

Area	Even Year	Odd Year
Chambers	1,700	1,300
Nisqually	27,000	18,000
Misc 13	1,300	800

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Weir removed - no formal escapement estimate made from 2009-present