

National Marine Fisheries Service  
Report on Consideration of Statutory Factors under  
Section 120 of the MMPA

March 2, 2012

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## I. Introduction

The Marine Mammal Protection Act prohibits the take of marine mammals, with certain exceptions and exemptions. One exception is contained in Section 120, which gives us (NOAA Fisheries) authority to permit states to kill certain pinnipeds (seals and sea lions) that are having a significant negative impact on the decline or recovery of at-risk salmonids. Section 120 establishes procedural requirements and identifies specific factors the agency must consider. Authorization under Section 120 may also require environmental review under the National Environmental Policy Act (NEPA), and consultation under the Endangered Species Act (ESA).

In 2006, the States of Washington, Oregon, and Idaho (states) applied under Section 120 for authority to lethally remove California sea lions (CSL) at Bonneville Dam on the Columbia River. In 2008, after complying with the procedural and substantive requirements of the MMPA, NEPA, and ESA, we partially approved the states' request, issuing three letters of authorization valid for a five year period ending in June 2012, to lethally remove individually identifiable predatory CSLs lions at Bonneville Dam. The Ninth Circuit Court of Appeals vacated those authorizations in November 2010. The court upheld our NEPA analysis but remanded our MMPA Section 120 decision saying that we did not adequately explain our determination that pinnipeds are having a significant negative impact on at-risk salmonids, in light of past agency decisions the court considered relevant. In particular the court raised concerns about a prior NEPA finding of no significant impact for Columbia River fisheries to occur under *U.S. v. Oregon* from 2005 through 2007. The Ninth Circuit's decision invited us to better explain our Section 120 finding.

On August 18, 2011 the states requested once again an authorization (2012-2016) to permanently remove CSLs at Bonneville Dam, through intentional lethal means or transfer to permanent captivity. As before, the states propose that the total number of CSLs removed in any one year would not exceed 1% of the "potential biological removal" (PBR). The states would continue non-lethal deterrence efforts to reduce predation on salmonids and reduce the number of sea lions requiring removal. The states indicated they would review the program on an annual basis and evaluate its effectiveness at reducing predation.

A CSL would be eligible for removal if it has natural or applied features that allow it to be individually distinguished from other California sea lions and it: (1) has been observed eating salmonids at Bonneville Dam, in the "observation area" below the dam, in the fish ladders, or above the dam, between January 1 and May 31 of any year; (2) has been observed at Bonneville Dam on a total of any 5 days between January 1 and May 31 of any year (consecutive days, days within a single season, or cumulative days over multiple years); and (3) has been sighted at Bonneville Dam after being subjected to active non-lethal deterrence.

The states propose that capture, holding, and euthanasia of CSLs be carried out under the guidance of an already-established Institutional Animal Care and Use Committee (IACUC). When possible the states will facilitate the transfer of CSLs to pre-approved permanent captive

facilities. The states will continue to pursue non-lethal alternatives that reduce both sea lion predation on salmonids and the number of sea lions removed.

We have followed the procedures established in relevant statutes and regulations, and have considered the states' request in light of the statutory requirements. This document describes that consideration and findings under the MMPA. Separate documents describe consideration of the proposed action under NEPA (NMFS 2012) and the ESA (NMFS 2012a). These documents, together with the entire record of the 2008 action, and information developed subsequent to the 2008 authorization, provide the necessary support for the MMPA findings. We attach the March 2008 Decision Memorandum as an Appendix for ease of reference.

## **II. Legal Authorities Applicable to the States' Application**

### **A. MMPA Section 120**

Section 120 of the MMPA establishes a process for states to apply to NOAA Fisheries for authority to lethally remove "individually identifiable pinnipeds which are having a significant negative impact on the decline or recovery" of at-risk salmonids. *See* 16 U.S.C. § 1389. At-risk salmonids are those that have been listed under the ESA as threatened or endangered, those that are approaching listed status, or those migrating through the Ballard Locks in Washington. The application must include a means of identifying the individual pinniped or pinnipeds, a detailed description of the problem interaction, and the expected benefits of removal. If we conclude that the application presents sufficient information to warrant further action, we are to convene a pinniped-fishery interaction task force (task force), and the task force is required to recommend whether to approve or deny the proposed intentional lethal taking of the pinniped or pinnipeds.

In addition to the procedural requirements, Section 120 directs us and the task force to consider four substantive factors when evaluating whether an application should be approved or denied. *See* 16 U.S.C. § 1389(d). These include:

1. population trends and feeding habits of the pinnipeds; location, timing and manner of the interaction; and number of individual pinnipeds involved;
2. past non-lethal deterrence efforts and whether the applicant has demonstrated that no feasible and prudent alternatives exist and that the applicant has taken all reasonable nonlethal steps without success;
3. extent to which the pinnipeds are causing undue injury or impact, or imbalance with, other species in the ecosystem, including fish populations; and
4. extent to which the pinnipeds are exhibiting behavior that presents an ongoing threat to public safety.

The MMPA does not require consideration of any other factors in issuing an authorization under Section 120. Section 120's legislative history states ". . . the Committee recognizes a variety of factors may be contributing to the decline of these stocks, and intends that the current levels of protection afforded to seals and sea lions under the Act should not be lifted without first giving

careful consideration to other reasons for the decline, and to all other available alternatives for mitigation” (H. Rep. No. 103-439, at 40). This concern was neither included in Section 120 as adopted nor does the statute require us to first eliminate or greatly reduce other sources of impact on salmonids before acting under Section 120.

In accordance with the Ninth Circuit’s remand order, this document explicitly discusses the other administrative decisions referred to by the court and explains their relevance (Section VIII, Discussion of Additional Factors, below).

Section 120 also prohibits us from authorizing the lethal removal of pinnipeds listed under the ESA or designated under the MMPA as depleted or strategic. CSLs are neither listed under the ESA nor designated as depleted under the MMPA. The eastern stock of Steller sea lions (SSL) is listed as threatened under the ESA. The States did not request, and we did not consider authorizing, lethal take of SSLs. We did consider effects of our Section 120 authorization on SSLs in our both our NEPA and ESA documents.

## **B. The National Environmental Policy Act (NEPA)**

NEPA requires federal agencies to disclose the environmental effects of their actions. Depending on the action and whether the impacts to the environment would be significant, as the term is applied under NEPA, federal agencies may prepare an Environmental Assessment (EA) or Environmental Impact Statement. In 2008, we prepared a draft EA and released the document for a 30-day public comment period. After considering public comments, we issued a final EA (NMFS 2008a) and concluded that the decision to partially approve the States’ 2006 application would not have a significant impact on the quality of the human environment.

Prior to preparing this MMPA report, we prepared a supplemental information report (NMFS 2012) to determine whether there is a need to supplement the 2008 EA and finding of no significant impact (FONSI) or whether the existing NEPA analysis could support our decision to authorize lethal removal from 2012-2016. Having considered the Council on Environmental Quality’s supplementation criteria at 40 C.F.R. § 1502.09(c), we have concluded there is no need to supplement the 2008 EA and FONSI (NMFS 2012a).

## **C. The Endangered Species Act (ESA)**

Pursuant to Section 7(a)(2) of the ESA, federal agencies are required to consult on any action they authorize, fund or carry out to ensure the action is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. The proposed action here, similar to that authorized in 2008, may affect salmonids and SSLs listed as threatened or endangered under the ESA. When the effect is more than insignificant, a formal consultation is required. The Northwest Region completed formal consultation on the 2008 lethal removal action. We re-initiated consultation in late 2008, following the accidental death of two SSLs, on traps at the dam, in May 2008. We completed a second biological opinion on February 20, 2009. After receipt of the states’ August 2011

application, we reinitiated consultation on our approval of the states’ request for lethal removal authorization and produced a new biological opinion, which concludes that the proposed action is not likely to jeopardize the continued existence of any listed species (NMFS 2012b).

### III. History of Pinniped-Salmonid Conflict

California sea lions hunt for and eat migrating adult salmonids as the fish move through the tailrace below Bonneville Dam and pass into one of eight fishway entrances that lead to fish ladders located on the Oregon and Washington sides of the Columbia River. Five ESA-listed salmon and steelhead species are affected – upper Columbia River spring Chinook, Snake River spring/summer Chinook, Snake River steelhead, mid-Columbia River steelhead, and lower Columbia River steelhead. Upper Columbia spring Chinook are listed as endangered species while the rest are listed as threatened species. (Table 3.5-1 in the 2008 EA shows all listed salmonids in the Columbia Basin; Table 3.5-2 displays the salmonids’ run timing and how it overlaps with pinniped presence.)

#### A. Corps of Engineers’ Monitoring Data

Until 2001, few seals and sea lions were observed feeding in the area immediately downstream of the dam. In 2001, the U.S. Army Corps of Engineers (COE), which operates the dam, began to monitor marine mammal predation on ESA listed salmonids in the tailrace of the dam. COE monitors have tracked numbers of sea lions (including how many are new versus repeat visitors), the number of days individual sea lions are present in the area, and the numbers of salmonids consumed. From 2002 to 2003 the total numbers of sea lions observed below the dam rose from 31 to 109 animals, 104 of which were CSLs (Table 1). The observed number of CSLs decreased slightly each year through 2007, when the observed number was 71. The observed CSL numbers rose again in 2008 (82), declined in 2009 (54), rose again in 2010 (89), and declined in 2011 (54) (Table 1). These numbers represent the minimum estimated total number of CSLs observed between January 1 and May 31 in each year. More pinnipeds were almost certainly present than were actually observed, since observations were recorded only from observation stations at the dam, observations did not occur at all hours, and observers counted only identifiable sea lions.

The COE data (Table 1) also indicate that the average number of days individual CSLs were observed to be present increased from 5.3 days in 2002 to 19.9 and 19.7 days in 2006 and 2007, respectively, and just above 19 days in 2008 and 2009. That average decreased to 9.3 days in 2010 and again to 7.3 days in 2011. Table 1 also shows that since 2004, CSLs arrived much earlier than in the first two years of observation, in some cases more than two months earlier. After 2004, CSLs also tended to stay somewhat longer (into late May or early June).

**Table 1: Summary of Observed Annual Pinniped Abundance and Duration at the Bonneville Dam Tailrace – 2002-2011**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011

<b>Min. total number of individual pinnipeds</b>	31	109	104	86	86	82	123	82	166	144
<b>California sea lion</b>	30	104	99	81	72	71	82	54	89	54
<b>Steller sea lion</b>	0	3	3	4	11	9	39	26	75	89
<b>Harbor seal</b>	1	2	2	1	3	2	2	2	2	1
<b>Maximum daily number of pinnipeds</b>	14	32	37	43	46	54	63	47	69	48
<b>Maximum number of days individual California sea lion was present</b>	16	25	33	39	73	70	80	67	39	31
<b>Average number of days California sea lions were present</b>	5.3	6.6	7.8	7.5	19.9	19.7	19.2	19.1	9.3	7.3
<b>Date of first California sea lion sighting</b>	3/20	3/14	2/22	2/20	2/9	1/8 <sup>a</sup>	1/9 <sup>a</sup>	1/5	1/8	2/21
<b>Date of last California sea lion sighting</b>	5/17	5/27	5/26	6/10	6/5	5/26	6/2	5/29 <sub>b</sub>	6/1	6/16 <sup>c</sup>
<b>Total days California sea lions were present</b>	59	71	95	96	106	123	146	145	145	100

Source: (Stansell pers comm. 2008; Stansell et al. 2009; Stansell et al. 2010; Stansell et al. 2011; Stansell pers comm. 2012)

a - In 2007 a CSL was seen at the dam in the fall (11/8/07) prior to the 2008 spring season and in 2008 CSLs were observed as early as 9/18/08 prior to the 2009 season.

b - In 2009 one CSL passed the dam and remained upriver and in the forebay all summer, fall and winter.

c – In 2011 one CSL passed the dam and remained upriver and in the forebay all summer (to date).

Table 2 shows that predation of salmonids primarily by CSLs increased steadily from 2002 through 2010, when the expanded<sup>1</sup> estimate of predation, based on observations, hit a high of 6,081 salmonids consumed (5,095 by CSLs and 986 by SSLs). In 2011 salmonid consumption declined to 3,557 (2,527 by CSLs and 1,030 by SSLs). Table 3 compares predation by CSLs and

<sup>1</sup> Surface observations are used to estimate consumption of salmonids. Since observers are not present at all times interpolation and expansion is used to estimate salmonid consumption. Estimates for the observation areas are combined to calculate total daily estimated consumption for the Bonneville Dam tailrace. For days on which no observations were made, linear interpolation was used to fill in the data gaps. All daily estimated consumption totals were added to get the total *expanded consumption estimate* for the year. The *minimum estimated impact* on salmonids passing during the observation period (expressed as percent of run) was calculated by dividing the expanded salmonid consumption estimate by the expanded salmonid consumption estimate plus the total salmonid passage count from Bonneville Dam for the January 1 through May 31 time period.



SSLs. While both CSL and SSL predation in Tables 2 and 3 are minimum estimates, for the reasons stated previously, it is likely that the underestimation of SSL predation is greater because SSL predation is more difficult to detect (Stansell et al. 2011). This is because the animals stay farther from the observation area, may eat fish whole, and may consume fish underwater (Stansell et al. 2011). (Additional estimates of CSL predation based on bioenergetic models are presented in subsection C below.)

Some measures of CSL predation at Bonneville Dam declined in 2011 compared to previous years. The average number of days CSLs were present was the lowest since 2005 and the maximum number of days an individual CSL was present was lower than during 2006 through 2009. In addition, as shown in Table 2, the estimated numbers of salmonids consumed by CSLs declined in 2011 to the lowest level since 2006. Stansell et al. (2011) notes that the decline in various measures of predation may be due to the removal of the experienced animals in 2008, 2009, and 2010, but acknowledge that there is insufficient data to reach a firm conclusion.

While the numbers of observed salmonids consumed rose steadily from 2002 to 2008, the size of the salmon run fluctuated. For this reason, the pinniped predation rate did not rise steadily but fluctuated with the run size. For example, an estimated 3,859 salmonids were consumed in 2007, with a salmonid run size of only 88,474, resulting in a calculated predation rate of 4.2 percent. By comparison, the largest estimated numbers of salmonids eaten occurred in 2010 (6,081), yet the predation rate was the lowest since 2004 because the salmonid run was larger that year (267,194).

In addition to observations of salmonids actually eaten below Bonneville Dam, there are many more observations of salmonids passing the dam that show injuries consistent with pinniped interactions, such as scarring and bite marks. Rub et al. (2010) reported that in 2005 up to 37 percent of salmonids were injured (i.e., scarred) by pinnipeds, and that in 2008 and 2010, rates were 24.8 and 29 percent, respectively. It is not possible to estimate how many of these salmonids subsequently died of their injuries prior to spawning, or to determine where in their migration the injured salmonids encountered pinnipeds. However, it is likely that the amount of mortality exceeds the modeled consumption discussed below due to subsequent mortality upstream from Bonneville Dam.

**Table 2 – Expanded Estimates of Salmon Predation below Bonneville Dam by All Pinnipeds Based on Daylight Observations (January 1 – May 31)**

	Total	All Pinnipeds		CSL		SSL	
		Estimated	%	Estimated	%	Estimated	%
		Salmonid	Salmonid	Run	Salmonid	Run	Salmonid
Year	Passage	Catch	Taken	Catch	Taken	Catch	Taken
2002	281,785	1,010	0.36%	1,010	0.36%	0	0.00%
2003	217,934	2,329	1.06%	2,329	1.06%	0	0.00%
2004	186,770	3,533	1.86%	3,516	1.85%	13	0.01%
2005	81,252	2,920	3.47%	2,904	3.45%	16	0.02%
2006	105,063	3,023	2.80%	2,944	2.73%	76	0.07%

<b>2007</b>	88,476	3,859	4.18%		3,846	4.17%		13	0.01%
<b>2008</b>	147,534	4,466	2.94%		4,294	2.83%		172	0.12%
<b>2009</b>	186,060	4,489	2.36%		4,037	2.12%		452	0.24%
<b>2010</b>	267,184	6,081	2.23%		5,095	1.87%		986	0.37%
<b>2011</b>	223,380	3,557	1.60%		2,527	1.10%		1,030	0.50%

Source: Stansell et al. 2011

**Table 3 – Comparison of Salmonids Caught by CSL v. SSL 2002 through 2011**

	<b>Total</b>	<b>All Pinnipeds</b>		<b>CSL</b>		<b>SSL</b>	
		<b>Estimated</b>	<b>%</b>	<b>Estimated</b>	<b>%</b>	<b>Estimated</b>	<b>%</b>
	<b>Salmonid</b>	<b>Salmonid</b>	<b>Run</b>	<b>Salmonid</b>	<b>Catch</b>	<b>Salmonid</b>	<b>Catch</b>
<b>Year</b>	<b>Passage</b>	<b>Catch</b>	<b>Taken</b>	<b>Catch</b>	<b>Taken</b>	<b>Catch</b>	<b>Taken</b>
<b>2002</b>	281,785	1,010	0.36%	1,010	100%	0	0%
<b>2003</b>	217,934	2,329	1.06%	2,329	100%	0	0%
<b>2004</b>	186,770	3,533	1.86%	3,516	99.5%	13	0.5%
<b>2005</b>	81,252	2,920	3.47%	2,904	99.5%	16	0.5%
<b>2006</b>	105,063	3,023	2.80%	2,944	97.4%	76	2.6%
<b>2007</b>	88,476	3,859	4.18%	3,846	99.6%	13	0.4%
<b>2008</b>	147,534	4,466	2.94%	4,294	96.1%	172	3.9%
<b>2009</b>	186,060	4,489	2.36%	4,037	89.9%	452	10.1%
<b>2010</b>	267,184	6,081	2.23%	5,095	83.8%	986	16.2%
<b>2011</b>	223,380	3,557	1.60%	2,527	71.0%	1,030	29.0%

Source: Expanded estimates of observed predation (Stansell et al. 2011).

Since 2005, the COE, NOAA Fisheries, and the States of Oregon and Washington have tested a variety of non-lethal methods to deter CSLs from preying on salmonids in the area below the Dam, but these methods have been unsuccessful in reducing total pinniped predation (Task Force 2010; Stansell et al. 2010).

## **B. Permanent Removal of Pinnipeds under the 2008 Authorization**

Under our 2008 Section 120 authorization, the states trapped 53 California sea lions from 2008 through 2010. Some CSLs were trapped multiple times. Of these, 36 CSLs were found to meet the criteria for removal and were permanently removed (10 to permanent captivity, one died under anesthesia, and 25 were chemically euthanized).<sup>2</sup> The remaining 17 CSLs that did not meet the removal criteria were branded and released along with 12 Steller sea lions that were incidentally captured during directed trapping activities. In May 2008, two of the traps were

<sup>2</sup> The states permanently removed a number of individually identifiable predatory CSLs as a result of trapping efforts elsewhere in Oregon, e.g., Astoria. As with the previous effort, the states will be authorized to permanently remove any CSL on the list of predatory animals wherever it may be found, with the exception of rookeries.

closed under unknown circumstances and were discovered with four California sea lions and two Steller sea lions inside. By the time crews arrived to open the traps all six animals had succumbed to heat exhaustion. One California sea lion that died during the accidental trapping event met the criteria for removal bringing the total removed under the 2008 authorization to 37 California sea lions. A law enforcement investigation into the accidental mortality found no evidence of human involvement in closing the traps on the unintended victims. The states halted the lethal removal program in response to the Ninth Circuit ruling and no sea lions were permanently removed between January and May 2011. In mid-May, we issued a second authorization, described below, and one additional CSL was removed prior to revocation of the authorization in July 2011. The removal program did not last long enough to yield firm conclusions about its effectiveness; thus, we are unsure whether, due to the limited time horizon and dataset, the decrease in salmonid consumption by CSLs in 2011 is related to the sea lion removals in 2008 through 2011.

### C. Pinniped Impacts on at-Risk Salmonids

The 2008 EA presents a range of values for the numbers of at-risk salmonids consumed by CSLs based on different methods of estimation. For the 2008 analysis we calculated the *potential* consumption of salmonids based on: (1) the mean number of California sea lions at the dam from 2003-2007 (86); (2) the average number of days each individual sea lion was present at the dam (20.3); and (3) an estimate of California sea lion salmonid consumption based on energetic modeling (1.48 fish/day) at the low end of the range, and the observed maximum number of fish consumed by an individual (10 fish/day) at the high end of the range. The 2008 calculation yielded an estimated 2,584 to 17,458 salmonids consumed by California sea lions, indicating that salmon consumption could be much higher than observed (NMFS 2008). For the present request we updated the evaluation of potential consumption using data on: (1) the average of the minimum estimated total number of California sea lions at the dam in 2008-2011 (70) (NMFS 2012a, Table 1); (2) the average number of days each individual California sea lion was present (13.7) (NMFS 2012a, Table 1); and (3) an estimate of California sea lion salmonid consumption based on updated energetic modeling (3 fish/day) (Wright, ODFW) at the low end of the range, and the observed maximum number of fish consumed by an individual (10 fish/day) at the high end of the range. The results of these calculations yield an estimated 2,877 to 9,590, indicating as before that consumption may be much higher than that observed.<sup>3</sup>

As noted above, many salmonids passing the dam are observed with injuries consistent with pinniped predation, but there are no data to indicate the level of mortality associated with these injuries. A recent tagging study on the influence of pinniped-caused injuries on survival of

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<sup>3</sup> The estimates based on bioenergetics (1.48 fish/day in 2008 and 3 fish/day currently) were produced primarily as a comparison to the observations. The low end of the range using bioenergetics is lower than the estimates based on observations both for the period 2002-2007 (a bioenergetic estimate of 2,584 versus observed predation of 2,758) and 2008-2011 (a bioenergetic estimate of 2,877 versus observed predation of 3,866). Thus both in the present analysis as in the 2008 EA, the low end of the range remains the observed levels of predation.

Columbia Basin salmonids (Naughton et al. 2011) concluded that injuries from pinnipeds occurred on a high proportion of Columbia River salmonids but did not consistently influence survival of Chinook or steelhead to spawning areas. Spring Chinook and steelhead showed more negative survival effects from pinniped injuries than summer or fall Chinook with all years of the study combined. Fish without injuries survived at higher rates in 80% of bi-weekly sampling periods for spring Chinook and 90% of sampling periods for steelhead. The differences were small, however, and rose to the level of statistical significance in only one year of the eight year study for spring Chinook and two years of the study for steelhead. The study also showed that the proportion of pinniped-caused injuries tended to decrease with increasing run size (density dependent effect), and larger fish tended to have a higher incidence of injuries than small fish. This later finding may indicate that larger fish may be more likely to be attacked or that smaller fish may be less likely to survive an attack and escape with an observable injury.

In response to comments from the Marine Mammal Commission during the 2008 and current decision-making processes, and in response to the Ninth Circuit court's decision, we sought to further quantify the impact of pinniped predation at Bonneville Dam on salmonid populations in light of all other impacts affecting the same populations. We asked the Northwest Fisheries Science Center (Center) if it would be possible to model the effect by incorporating a constant level of pinniped predation into salmonid life cycle models the Center was developing. The Center produced preliminary results, but we considered the modeling exercise too uncertain and the results of absolute impacts too inconclusive and untested to provide a reliable basis for our MMPA decision-making process. Until the models have been further reviewed, both within and outside the agency and results produced and validated for several populations, the results are not useful for establishing a quantitative estimate of pinniped impacts on salmonids. At this time, there is no other model that can reliably quantify the impact of pinniped predation.

In response to our inquiry, the Center (Ferguson pers comm. 2011) described in a memorandum two distinct concerns about pinniped predation. One is that the predation occurs disproportionately on early and late arriving fish. The best available information shows that these fish are from discrete populations, thus pinniped predation is having a disproportionate impact on those populations. This in turn affects the viability of the listed ESUs and DPS.

The other is that a constant level of impact has a depensatory effect on salmon populations (i.e., reproduction is less successful as abundance declines), increasing the risk of populations entering an "extinction vortex" at low run sizes. Thus, although the Center could not assist us with reliable quantitative estimates at this time, they did provide information valuable in qualitatively assessing the risk pinniped predation poses to salmonids.

## **IV. Procedural and Litigation History**

### **A. States' 2006 Request and the 2008 Authorization**

On December 5, 2006, the states asked NOAA Fisheries to authorize the intentional lethal removal of CSLs in the Columbia River, particularly in the area from Bonneville Dam to

navigation marker 85, approximately six miles downstream from the Dam. As described in more detail in the states' application and our 2008 decision memorandum and EA, the states expected in the first year to permanently remove less than 1% of the potential biological removal level (PBR) of CSLs. At the time of the application, the PBR level was 8,333 animals out of an estimated population of 237,000. The states also highlighted past efforts to non-lethally deter pinnipeds below the dam and concluded such efforts had proven unsuccessful. The states' application described the expected benefit of pinniped removal to be a reduction in a recent, unnatural, and significant source of mortality of the affected salmonids. This benefit would be part of an ongoing comprehensive fish recovery strategy, in which substantial actions are being taken in several areas to improve the survival of at-risk Columbia River salmon and steelhead runs.

Pursuant to Section 120, we determined that the states' application provided sufficient evidence to warrant establishing a task force. The task force convened in September 2007 and, after considering the states' application, public comments on the application, and other information, delivered its recommendation in November 2007. The majority of the task force members (17 of 18) recommended authorizing lethal removal, and presented two options, each with different levels of support from task force members. One member submitted a minority opinion opposing the states' application. The minority opinion was included as an Appendix in the final task force report. Thereafter, we developed a proposal to authorize lethal removal, analyzed the proposal in an EA, completed a Section 7 consultation under the ESA, considered all public comments (including those from the Marine Mammal Commission), and partially approved the states' request, issuing letters of authorization on March 18, 2008.

We authorized the states to lethally remove only individual sea lions that are highly identifiable (natural markings or man-made ones like branding), and are observed eating salmonids after non-lethal deterrence methods are unsuccessful. The authorization allowed as many as 85 sea lions to be lethally removed annually, though we estimated the actual number would be closer to 30 a year. As an alternative limit to the number of sea lions that could be lethally removed, the authorization provided that the states were to suspend lethal removal efforts if the 3-year average of observed predation of adult salmonids was reduced to 1% or less of the fish tallied by counters at the dam.

The states were given the option of immediately killing qualifying sea lions or capturing and holding them for a brief period to see if they could be placed in a public display facility. The authorization required the states to form an animal care committee, approved by us, to advise on standards for humanely capturing, holding and killing predatory sea lions. The states were required to implement specific safety standards to protect the public if any firearms were used. The authorization also included monitoring and reporting requirements.

Shortly after we issued the authorization, the Humane Society of the United States filed a complaint in the U.S. District Court in Oregon. Plaintiffs alleged that our approval of the lethal removal of CSLs violated Section 120 of the MMPA and NEPA. In particular, plaintiffs argued our decision was factually indefensible and inconsistent with other agency decisions under NEPA and the ESA involving salmonids (specifically, fishery harvest and hydropower operations). The plaintiffs alleged that we failed to provide an adequate explanation under the

Administrative Procedure Act as to why sea lion predation was having a significant negative impact to listed salmonids under the MMPA, whereas take by fisheries and hydropower operations were insignificant or do not jeopardize the continued existence of salmonid species under NEPA and ESA, respectively. Moreover, plaintiffs claimed that we violated NEPA by not preparing an Environmental Impact Statement and not preparing an adequate EA. In November 2008, the district court issued an order upholding our approval of the lethal removal program and our evaluation of impacts under NEPA. Plaintiffs appealed, but the circuit court declined to halt the removal program while the appeal was pending.

In October 2010, we re-convened the task force to review the effectiveness of the lethal removal program and to consider information accumulated since the program was initiated in 2008. This review was consistent with one of the recommendations of the task force in 2007. We released the task force's report in December 2010. The task force concluded, having considered the available new information between 2008 and 2010, that the program had not been sufficiently successful in reducing pinniped predation on salmonids and made several recommendations to improve its effectiveness. To facilitate focused discussion on recommendations, the Northwest Region prepared five general questions for the task force to consider in its deliberations, one of which we later withdrew (these questions are included in the Task Force Report and Recommendations (2010)).

The task force noted that the program authorized under Section 120 had not been fully implemented and that the level of implementation to date had not reduced predation on salmonids to the interim goal recommended in the task force's 2007 recommendations, that is a predation rate no greater than 1% of the salmonid run size. The task force recommended that the 1% threshold not be changed because it had not been fully tested. The task force also noted that non-lethal hazing had not been effective at reducing predation in the area during this time and recommended redirecting part of the resources supporting hazing to more effective alternatives. The task force also concluded that the criteria in the 2008 authorization for identifying predatory sea lions were cumbersome and may make the program ineffective at reducing predation on threatened or endangered salmonids. The task force recommended four options for simplifying the criteria so that more sea lions could be added to the list of identified predatory sea lions. Finally, the task force recommended the states modify trapping protocols and effort to increase the number of CSLs captured and to increase the opportunity for use of firearms to remove predatory sea lions.

Subsequent to our re-convening the task force but prior to release of its recommendations, the Ninth Circuit rendered its decision on the 2008 authorization, on November 23, 2010. The Ninth Circuit concluded that our MMPA decision lacked a satisfactory explanation concerning two main points: (1) the seemingly inconsistent findings that sea lion predation is significant for purposes of the MMPA, but similar or greater levels of take of the same salmonid populations by other activities – particularly fishery harvests in the Columbia River for the period from 2005 through 2007 – were determined to be not significant under NEPA; and (2) the agency's failure to explain adequately what the court viewed as the agency's implicit finding that a CSL predation rate of greater than 1% results in a significant negative impact on the decline or recovery of salmonid populations. The Ninth Circuit upheld our NEPA analysis. The circuit court directed the district court to vacate the decision authorizing lethal removal and remand it to

NOAA Fisheries “. . . to afford the agency the opportunity either to articulate a reasoned explanation for its action or to adopt a different action with a reasoned explanation.” *HSUS v. Locke*, 626 F.3d 1040, 1053 (9<sup>th</sup> Cir. 2010).

## **B. States’ 2010 Request and the 2011 Authorization**

In response to the court’s 2010 decision, the States of Washington and Oregon submitted a new request for lethal removal authorization on December 7, 2010. We considered the request and new information available since our prior authorization, including the task force recommendations. The agency again authorized lethal take, under similar conditions to the 2008 authorization (albeit with two minor modifications), with new letters of authorization issued on May 13, 2011. On May 18, the states trapped and euthanized one qualifying CSL. Plaintiffs again filed suit in federal district court in Washington, D.C., noting that the circuit court had vacated our 2008 decision and alleging, among other things, that NMFS should have followed Section 120’s procedural requirements prior to issuing the new authorization (including public notice and comment on the states’ request). Shortly thereafter and having notified the States, we revoked the May 13 authorization on July 22, 2011, and HSUS voluntarily withdrew their lawsuit.

On August 18, 2011, the states submitted the current request, which is considered here. The states’ request seeks authority to remove CSLs at Bonneville Dam under essentially the same conditions as our prior authorizations. We published the states’ application in the Federal Register on September 12, 2011, and requested comment on the application and other relevant information concerning the pinniped-salmonid conflict at Bonneville Dam. *See* 76 FR 56167 (September 12, 2011). We reconvened the task force in October 2011 to evaluate the states’ application and public comments and to recommend whether NOAA Fisheries should approve or deny the proposed intentional lethal taking program. The task force’s final report and recommendation was produced on November 14, 2011.

## **V. Findings and Considerations to Support Authorization**

The states’ request for authorization is supported by the following findings and considerations.

### **A. Section 120(b)(1) – Individually Identifiable Pinnipeds Which are Having a Significant Negative Impact**

In considering a state’s request to lethally remove pinnipeds, the agency is required, pursuant to section 120(b)(1), to make a determination whether individually identifiable pinnipeds are having a significant negative impact on the decline or recovery of at-risk salmonid fishery stocks. In our 2008 decision documents, which are incorporated here by reference, we explained the two-part interpretation we adopted for applying this standard. First, we determined whether pinnipeds collectively are having a significant negative impact on listed salmonids; and second, we determined which pinnipeds are significant contributors to the impact and therefore may be

authorized for removal. Our two-part interpretation was upheld by the Ninth Circuit in *HSUS v. Locke*. We apply this interpretation to the current facts, as described in more detail below.

## 1. Significant Negative Impact

The current facts support a conclusion that collectively pinnipeds at Bonneville Dam are having a significant negative impact on ESA listed salmon and steelhead species. The following factors<sup>4</sup> are particularly relevant to this conclusion:

### 1. The predation is measurable, has grown since 2002, and could continue to increase if not addressed.

Table 2 shows the estimated predation (observation based) of salmon, primarily by CSLs, from 2002 through 2011. Except for decreases from 2005 to 2006, and 2010 to 2011, the observation-based estimate of salmonids consumed by pinnipeds has steadily grown, reaching a high in 2010 of 6,081 salmonids. The observation-based estimate of salmonids consumed increased from 2006 to 2007 even though the salmonid run size was smaller. Salmonid consumption by pinnipeds increased six-fold from 2002 to 2010. While some of this growth in predation is attributable to SSLs, CSLs account for the majority of salmonids caught (Table 2). The only year in which the level of predation declined was 2011. Given that past predation has grown steadily except in 2011, there is no evidence to suggest that pinniped predation levels have reached a maximum possible level. We therefore expect that predation levels could increase if not addressed.

As described above, in 2008 we also calculated the potential consumption of salmonids using the bioenergetic model, which yielded a low of 2,584 and a high of 17,458, indicating that actual salmonid consumption could be much higher than the observation-based estimates. For the current decision we used an updated bioenergetic model, which yielded an estimated average annual consumption between 2008 and 2011 of 2,877 to 9,590. In spite of the higher consumption rate (3 fish/day) used in the updated bioenergetic model, the updated estimates are lower due in large part to a lower average number of CSLs present and shorter average residency time since 2007, but the estimates fall within the range previously analyzed in 2008. The updated calculation still indicates that potential consumption could be substantially higher than observed consumption. For example, the average calculation of consumption from the bioenergetics model, 9,590 salmonids, represents about 4.3% of the run for 2011 (which had relatively strong returns), and 11.7% of the run in 2005, when the run size was much lower (but still higher than many years during the 1990s). When considered on a cumulative basis (e.g., 2002 – 2011), the results demonstrate that CSLs are capable of consuming a considerable number of fish (Table 2).

We agree with the task force that ongoing management of predatory CSL is necessary if such devastating losses are to be prevented. Given that it is most realistic to kill only those sea lions caught in the traps, rather than shoot free-ranging animals, it can take multiple years of removals

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<sup>4</sup> The factors enumerated below were made available for public comment through our September 12, 2011, Federal Register Notice announcing receipt of the states' request for a lethal removal authorization.



before the most experienced and effective predators are removed. Stansell et al. (2011) hypothesize that the three years of CSL removal may explain the low numbers of CSLs and the decrease in CSL predation observed in 2011. If lethal removals are delayed until salmonid run sizes are once again low, it may be too late for those efforts to forestall the kind of impact seen at Ballard Locks. Therefore, without a sustained, multi-year program in place, the resource agencies will be unable to respond in a timely and effective manner.

**2. Non-lethal deterrence efforts have been unsuccessful at reducing the number of sea lions or amount of predation.**

Non-lethal deterrence efforts have been unsuccessful at reducing the numbers of sea lions or the amount of predation and there is no reason to expect such deterrence will be successful in the future. Lethal removals over the past three years may have slowed the growth in numbers of salmonids consumed, although available evidence is too limited to support firm conclusions.

**3. The level of adult salmonid mortality is sufficiently large to have a measurable effect on the numbers of listed adult salmonids contributing to the productivity of the affected ESUs/DPSs.**

Both the observed and estimated predation rates described above represent levels of mortality that can have a measurable effect on the survival and recovery of the listed stocks. In preparing the biological opinion on the federal Columbia River Power system (FCRPS), we estimated the current spawner return rates for each population of the listed salmonid ESUs/DPSs, and the spawner returns needed to achieve a low likelihood of extinction and adequate potential for recovery. For example, needed survival improvements for different populations of Snake River spring/summer Chinook range from no improvement to a five-fold improvement. Loss of potential spawners to predation on the order of that observed at Bonneville Dam can affect the ability to achieve the productivity improvements needed for many of the populations in this ESU. As noted above, although fully vetted or sufficiently validated life cycle models are not yet available to quantify that impact, the Northwest Fisheries Science Center opinion is that pinnipeds at Bonneville Dam have a disproportionate impact on early and late run fish, and on all populations at low run sizes. Increased predation at low run sizes has a compensatory effect on salmon populations (i.e., reproduction is less successful as abundance declines), increasing the risk of populations entering an “extinction vortex” at low run sizes.

**4. In 2010, California sea lion reached their highest numbers since 2004, thereby demonstrating that their numbers are as yet unpredictable and can easily grow.**

CSL numbers at Bonneville Dam in 2010 were the highest since 2004, indicating that their numbers are unpredictable and can easily grow. *See* Table 1. While fluctuations in numbers at Bonneville Dam are anticipated, prior history demonstrates that numbers can increase significantly from year to year, which in turn has the potential to amplify the negative effect on listed salmonids.

**5. The predation rate from California sea lions increases when salmonid run sizes decrease.**

Because salmonids passing Bonneville Dam congregate in front of 8 fish ladder entrances, and salmonids are necessarily confined to a small area in order to pass through the ladders, we expect that CSLs could continue to consume large numbers of salmonids even if the salmonid run sizes decrease to the low levels seen in the 1990s. This was demonstrated in 2005 and 2007. In that event, the proportion of the run they consume would be much higher than what has been observed or estimated on average in the past. Salmonid abundance is highly variable and cyclical and it is likely that at some point in the near future salmonid run sizes will decrease to levels much lower than those seen in the past few years.

Absolute levels of pinniped predation steadily increased at Bonneville Dam from 2002 through 2010. Although the predation level decreased in 2011, there is no information to suggest it will remain at that level. The experience at Ballard Locks in Washington suggests that where human structures cause adult salmonids to congregate and delay, CSLs can effectively consume a majority of the salmonids present. While the area at Bonneville Dam is larger than the area at Ballard Locks, the observed increase in years when salmonid numbers are lower suggests that sea lions at the dam are effective predators even when the prey is relatively less abundant. In the event of extremely low run sizes, it is likely that pinniped predation would have a very large effect at Bonneville Dam. As a demonstration of this real possibility, in 2011, from April 1 through April 22, the observed sea lion predation ranged from 18% to 48% of Chinook arriving at the dam on a daily basis (Stansell et al 2011b & 2011c). In years of low abundance, such as those seen in the mid to late 1990s, the elevated predation rates observed early in the season would be possible throughout the season, resulting in devastating losses.

**6. CSL and SSL predation on at-risk salmonids at Bonneville Dam has a combined effect.**

In 2010 and 2011, SSL presence at the dam grew several-fold, as has the level of predation on salmonids by SSLs. That predation is now an independent measurable source of mortality and the two sources of mortality have a cumulative effect. Because SSLs are listed under the ESA and may not be lethally removed, the only source of pinniped predation that can currently be addressed under the MMPA is predation by CSLs.

**7. The mortality rate for listed salmonids is comparable to mortality rates from other sources that have resulted in the agency using its ESA authorities to reduce the impact.**

The estimated mortality rates for listed salmonids from pinnipeds at Bonneville Dam are in the same range as mortality rates from other sources that have led to corrective action under the ESA. Because the listed salmonids are subject to mortality from a variety of sources, we have imposed reductions on all sources of mortality under section 7(a)(2) of the ESA, allocating those reductions based on the action's contribution to the historic decline of the species, the current magnitude of the mortality, the impact to other values (particularly the exercise of treaty rights), and the feasibility of achieving the reduction. As an example, although harvest rates on Snake River and upper Columbia River spring Chinook were already restricted prior to ESA listing (from historical highs in excess of 40% to an average of 8% prior to listing), we nevertheless

required a harvest schedule that reduced harvest rates even further at low run sizes. A comparison of pinniped predation and harvest rates is discussed further below in Section VI.A.

Another example is the survival improvements sought from the FCRPS. In our biological opinions on operation and maintenance of the hydropower system, we concluded that the proposed action – operation and maintenance of the Federal hydropower system - jeopardized the continued existence of listed upriver stocks. We included as a part of our reasonable and prudent alternative a program to reduce northern pikeminnow predation on Snake River spring/summer Chinook sufficient to increase survival by a relative 1 percentage point and bird predation by 2 percentage points. A comparison of pinniped predation and hydropower operations is discussed further below in Section VI.B.

No single one of these mortality reductions will by itself recover listed salmonids. Rather, as with other actions, our approach has been to seek reductions in all sources of mortality, with the goal of reducing overall mortality to the point that the species can survive and recover. In the biological opinions on the FCRPS, we concluded that the accumulation of proposed mortality reductions (including controlled levels of pinniped predation) will measurably improve the chances of survival and recovery of all five of the ESUs/DPSs considered here.

The limited authorization requested by the states will not eliminate pinniped predation in the lower Columbia River or at Bonneville Dam, but that is not a requirement of Section 120 or of prudent wildlife management. The authorization to the states to remove a limited number of predatory CSLs under carefully controlled circumstances will enhance our efforts to control a significant, and currently unchecked, source of mortality for threatened and endangered Columbia River salmonids.

Although the Marine Mammal Commission recommended that we adopt a quantitative threshold for determining when pinniped predation is significant, we decline to adopt a "bright line" approach, for several reasons. First, there are many different factors that affect salmonids and many different salmonid populations affected by sea lion predation. Identifying a single threshold to guide our decisions under either of these situations would not accommodate the wide range of variability inherent in the effects of various factors on a given population's or several populations' vulnerabilities to pinniped predation.

Second, a bright-line threshold between significant and insignificant suggests a relatively high level of certainty in our estimates of the levels of predation or a population's ability to sustain such predation. In the Bonneville case, we know that observed predation rates are underestimates for the reasons previously described. Another estimate on the number of salmonids taken by CSLs, based upon bioenergetic modeling, suggests the level of predation could be much higher than the observations indicate. This uncertainty is further confounded by the annual variability in fish passage at the Dam, which causes high variability in predation rates, as a function of fish passage.

Finally, we are concerned about pinniped predation because it is unmanaged. To date we have been unable to demonstrate that we can decrease the numbers of pinnipeds or the numbers of salmonids they consume (although as noted earlier, Stansell et al. (2011) hypothesize that the

decrease in CSL numbers in 2011 may be attributable to prior CSL removals). Salmon returns have been relatively high over the past decade, in part because of management actions, but also in large part because of favorable ocean conditions (Peterson et al 2010). It is very likely there will be a period of poor ocean conditions in the future and run sizes will decline. The characteristics of the fish ladders at the dam create a situation in which pinnipeds could consume a large proportion of a small run of returning adults, as witnessed at Ballard Locks. The risk is that by failing to employ all available management tools, even when salmonid run sizes are relatively strong, sea lion numbers will continue to grow and we risk being unable to act to control the risk when salmonid run sizes again decline.

## **2. Individually Identifiable Pinnipeds Which are Having the Impact**

The states' request defines "predatory" CSLs in the same manner as the 2008 authorization, with one minor change. They request that the definition of predatory CSLs include individually identifiable animals observed taking salmonids not just below Bonneville Dam but also in the fish ladders or above the dam. The remaining criteria that apply within the observation area below the dam (number of days present, time of year, subjected to hazing) would apply to animals taking fish at and above the dam. An animal meeting all of these criteria has learned that the area contains a preferred prey and is successful in pursuing it in that area, is persistent in pursuing that prey, and is not likely to be deterred from pursuing that prey by non-lethal means. The states' letter requesting authorization refers to the list we mutually maintain that includes animals currently meeting their proposed criteria. New animals could be added to the list in season if they meet the criteria.

## **B. Section 120(d) – Consideration of Other Factors**

In considering whether to approve the States' application, NMFS and the task force are to consider several factors, enumerated above under "MMPA Section 120" and discussed individually below.

### **1. Population trends and feeding habits of the pinnipeds; location, timing and manner of the interaction; and number of pinnipeds involved**

Section 117 of the MMPA directs us to prepare stock assessment reports for all stocks of marine mammals that occur in waters under United States jurisdiction. These reports describe the status of the stocks and enumerate human-caused mortalities and serious injuries by source. The most recent stock assessment report for CSLs was final in 2007 and concluded based on pup counts that the stock was at the carrying capacity of its habitat, though the report noted that that conclusion should be viewed with caution (Carretta et al. 2007). We released a new draft stock assessment report in August 2011, which includes updated census information based on pup counts (Carretta et al. 2011). The updated information shows that the population grew from an estimated 238,000 animals to an estimated 296,750 animals, suggesting that the stock may not be at carrying capacity. The minimum population size is determined from counts of both sexes and all ages at all major rookeries and haul-out sites in southern and central California during the

2007 breeding season. That estimate is 153,337 animals. CSLs outside California were not included in the estimate.

The stock assessment report calculates the PBR for CSLs to be 9,200 per year. The report estimates that the rate of fishing-related mortality is 337 animals per year and of all human-caused mortality is 431 animals per year. The total includes animals killed under the prior Section 120 authorization. Because total human-caused mortality is below PBR and the stock is not listed or likely to be listed as endangered or threatened under the ESA, the stock is not considered to be “strategic.” A goal of the MMPA is to reduce fishery-related mortality to levels that are insignificant and approaching zero. We have published guidance interpreting this provision, which states that if fishery-related mortality is less than 10% of PBR, it is “insignificant and approaching a zero mortality and serious injury rate.” For CSLs, the *total* human-caused mortality of 431 animals per year, which includes the removals under the prior Section 120 authorization, is less than 5% of PBR, well below the goal of the MMPA.

Table 1 shows the number of sea lions with either natural or human-applied identifying marks that were observed at Bonneville Dam from 2002 through 2011. It is likely that more pinnipeds are present than are observed, since observations are recorded only from observation stations at the dam, observations do not occur at all hours, and only sea lions with distinguishing features are counted. The observation areas are large and poor weather conditions, murky and turbulent water, and heavy debris can make it difficult to identify animals that might only surface for seconds. Because of these limitations, the exact number of CSLs arriving in the area each season is uncertain.

The proposed authorization would allow the states to remove 1% of the PBR limit for CSLs per year. Carretta et al. (2011) report the current PBR for CSLs is 9,200, so the states would be authorized to kill 92 animals per year. Due to the limitations of the proposed authorization, and practical considerations, we consider it likely the states would only kill about 30 CSLs per year under the proposed authorization. Under the 2008 authorization they killed no more than 15 per year, but they may be able to kill more than that in the future as a result of increasing the number of traps at Bonneville Dam. For purposes of analyzing impacts to CSLs as a result of the proposed authorization, we have assumed the states would kill the full number authorized (NMFS 2008a and NMFS 2011).

The criteria proposed for identifying predatory sea lions includes three concepts designed to limit removal of sea lions to only those animals that are major contributors to detrimental impacts on salmonids: (1) preying upon salmonids in the observation area; (2) repeated visits to the observation area; and (3) persistence in the observation area after being exposed to non-lethal deterrence methods.

## **2. Past non-lethal deterrence efforts and whether the applicant has demonstrated that no feasible and prudent alternatives exist and that past efforts have been unsuccessful**

From 2006 through 2011 the COE, the states of Oregon and Washington, and we have attempted to deter pinniped predation at Bonneville Dam using non-lethal methods. These methods include

physical barriers and acoustic devices to keep sea lions out of fishways, vessel chasing, underwater firecrackers, aerial pyrotechnics, and rubber bullets to chase sea lions away from the tailrace area immediately below the dam. Based on this experience, Stansell et al. (2011) observed that non-lethal methods temporarily move some sea lions out of the tailrace areas, but the animals typically return and resume foraging after the deterrence activity ceases. They conclude that non-lethal methods at best may have slowed the growth of pinniped predation. This is reflected in the increased numbers of salmonids observed being eaten by sea lions below the dam in 2007 compared with 2006, notwithstanding the fact that fewer sea lions were observed. Previous analysis indicated that non-lethal deterrence measures have not been effective in reducing total pinniped predation of salmonids in the area below the dam, and we continue to find that these efforts have limited utility because they result in only temporary displacement. Thus, non-lethal deterrence measures are currently not a feasible alternative to lethal removal. Although it would be preferable to reduce sea lion predation through non-lethal means, there are no additional known methods beyond those already tried. One manufacturer proposed an electrified field to deter pinnipeds, but information presented to the Task Force in 2010 indicated that studies of the experimental grid deterrence technology showed potential for negative effects on fish passage and we have determined that the technology is not suitable for deployment in the project area.

### **3. Extent to which such pinnipeds are causing undue injury or impact, or imbalance with, other species in the ecosystem, including fish populations**

Section III.C. above, describes the impact of pinniped predation on at-risk salmonids. Pinnipeds are opportunistic feeders and consume many species other than salmonids. While salmonids are by far their primary prey at Bonneville Dam, pinnipeds have also been observed consuming lamprey, sturgeon, and shad. Pinniped takes of lamprey (primarily by CSLs) grew from 5.6% of the total observed fish caught by pinnipeds in 2002, increased to 25.1% in 2005, then steadily declined through 2011 when they represented less than half a percent of all fish takes. Pinnipeds also are observed taking sturgeon. The observed catch of sturgeon by pinnipeds at the dam was 600 in 2008, 721 in 2009, 1,091 in 2010, and 1,350 in 2011 by Steller sea lions and 6, 37, 9, and 3 by California sea lions for the same years respectively. Stansell et al. (2011) hypothesized that the decline in sturgeon takes by CSLs in 2010 and 2011 could be due to the removals of larger animals during 2008 through 2011. There is presently not enough evidence to support a conclusion that these levels of consumption represent undue injury or impact to lamprey or white sturgeon at Bonneville Dam although both populations have declined.

Steller sea lions primarily prey upon sturgeon at Bonneville Dam but they are opportunistic predators and also take salmonids there. The states have not requested authority to lethally remove Steller sea lions, which are listed as threatened under the ESA. Harbor seals are present in small numbers and the states have not requested authority to lethally remove these pinnipeds.

### **4. Extent to which the pinniped behavior presents an ongoing threat to public safety**

There is no evidence that pinnipeds in the area immediately below Bonneville Dam present a threat to public safety.

## **VI. Discussion of Additional MMPA-Related Factors**

### *Humane Killing*

Section 120 does not require that the lethal removal be humane; however, we have included requirements intended to increase the likelihood that the capture, holding, transfer or killing of any sea lions will be humane. We have also included requirements to minimize risks to Steller sea lions.

### *Transfer to Permanent Captivity*

To the maximum extent practicable, captured predatory sea lions will be transferred to permanent captive facilities rather than euthanized. During 2008 through 2011, ten CSLs were transferred to permanent captivity. Section 120 does not authorize the transfer of captured predatory sea lions to a permanent captive facility. Accordingly, we relied on section 109(h) and 112(c) of the MMPA to support this effort. Section 109(h) allows government officials (i.e., federal, state, or local) to take marine mammals in the course of their official duties, including the non-lethal taking of nuisance marine mammals. In addition, section 109(h)(3) requires, if feasible, that any marine mammal taken by government officials as a part of official duties be returned to its natural habitat. If it is not feasible to return any of the predatory sea lions to their natural habitat, they may be retained in captivity and transferred to a permanent captive facility in accordance with section 112(c). These lines of authority were challenged in 1996 when sea lions were captured near Ballard Locks. The court supported our determination that: (1) the captured sea lions had been identified as candidates for lethal removal in the 1996 LOA, (2) we did not act unreasonably when we concluded they were “nuisance” animals, (3) it was not feasible to return the captured sea lions to the wild because they would be subject to immediate lethal removal by the State of Washington, and 4) we acted reasonably and within the scope of our authority when we captured the individual sea lions and made arrangements for their transfer to Sea World for public display (*Humane Society of the United States, et al. v. Department of Commerce, et al.*, Civil Action No. 96-0623 (CKK) (D.D.C. April 13, 1999)).

We and the states have determined that the CSLs at Bonneville Dam are nuisance animals. Since 2002 the number of CSLs at Bonneville Dam has increased. These animals migrate to the dam each season primarily to consume salmonids passing through the facility. Although efforts have been taken to non-lethally deter these animals, the results have been ineffective. Moreover, these animals have been seen preying on species other than salmonids (e.g., lamprey and sturgeon); removing fish from hooks or nets in commercial, recreational, or tribal fisheries; and impeding migration of other fish species through the fish passage facilities at Bonneville Dam (NMFS 1997).

For purposes of the 109(h)(3) determination and the 112(c) transfer, we have concluded it would not be feasible to return individually identifiable predatory sea lions to their natural habitat. This conclusion is based on the following reasons: First, the transfer program is designed to target

predatory sea lions that have no chance of being re-released into their natural habitat because of their contribution to the adverse impacts on salmonid stocks. In addition, the states have advised us that any captured predatory sea lion would be euthanized (provided authorization is granted), if a determination is made that the predatory sea lion would be returned to its natural habitat. With respect to the potential capture of sea lions that are not deemed to be predatory, the states would release these animals into their natural habitat. However, once these animals meet the definition of a predatory sea lion, they would become candidates for lethal removal or transfer to permanent captivity.

To facilitate rapid transfer of captured predatory sea lions if the situation were to arise, we have contacted permanent display facilities to determine their ability and willingness to accept captured predatory sea lions. Assuming these facilities commit to accepting CSLs, we would transfer the affected sea lion(s) to permanent captivity pursuant to Section 112(c), and the sea lions would be added to the inventory of captive marine mammals.

### *Monitoring*

Under the conditions of the proposed authorization, the states are required to develop and implement a monitoring plan to evaluate: (1) the impacts of predation, (2) the effectiveness of non-lethal deterrence, and (3) the effectiveness of permanent removal of individually identifiable predatory sea lions as a method to reduce adult salmonid mortality. To the extent practicable the states are required to use data collected by the COE or other agencies to help fulfill the monitoring requirement, avoid duplication of effort, and ensure data consistency across programs. If resources are available, the states are encouraged to monitor pinniped impacts on salmonids elsewhere in the lower Columbia River to assess the level of impact from predation relative to observed levels at Bonneville Dam and to other sources of mortality that are being managed under the various salmon recovery plans. The states are also required to submit monitoring reports to us annually, on or before November 1, to assist us and the task force in evaluating the effectiveness of lethal removal, as required by the MMPA. The reports shall include a summary of actions taken to reduce predation (non-lethal and lethal), the states' compliance with the conditions of the authorization, and plans for future actions in compliance with the authorization.

### *Contrast with Section 120 Authorization at Ballard Locks*

The situation at Bonneville Dam is distinguishable from that at Ballard Locks, where California sea lions were consuming as much as 60% of the run and their predation was threatening to extirpate steelhead from Lake Washington. In the case of the Ballard Locks in 1995, we initially limited the initiation of sea lion removal activities until a 10% predation rate was observed within a seven day period at the dam. However, this restriction was subsequently revised to remove that limit, based on the conclusion that even one steelhead mortality was significant. At the time of the Section 120 request at the Ballard Locks, sea lion predation was the principal factor affecting steelhead survival, in contrast with Columbia River stocks, which face a host of threats that all inflict an incremental amount of mortality.



## VII. Discussion of Prior Agency Decisions, Which the Court Found Relevant to the MMPA Decision

As noted above, the Ninth Circuit court held that our explanation of the 2008 decision under Section 120 authorizing limited lethal removals of CSLs at Bonneville Dam was “incomplete and inadequate to permit meaningful judicial review” with respect to its discussion of the analyses by NOAA and other federal agencies of certain fishery harvests and hydropower operations in other contexts.

This section describes our consideration of the past agency decisions cited by the court. Specifically we consider past agency decisions under NEPA regarding salmon harvest, and a 2007 biological assessment under the ESA from the Bureau of Reclamation, COE, and Bonneville Power Administration on the operation and maintenance of the FCRPS.

NEPA, ESA and MMPA are different statutes with different purposes, policies, and provisions. *See* 76 FR 56167, 56170-71 (September 12, 2011) (discussing our interpretation of each statute and its application under these circumstances). The agency’s decision to authorize the lethal removal of CSLs at Bonneville dam is governed by Section 120 of the MMPA. Section 120 applies to a unique and narrow set of circumstances and requires consideration of four specific categories of information. *See* 16 U.S.C. 1389(d)(1). In enacting Section 120, Congress recognized the problem of pinniped predation on at-risk salmonids and sought to provide NOAA and states with the tools to stem an emerging and unchecked source of mortality. While Congress specified fairly clear procedures for issuing a lethal removal authorization, the substantive standards (i.e., “individually identifiable pinnipeds” and “significant negative impact”) are less clear.

### A. Prior Agency Decisions Regarding Fisheries

Section 9 of the ESA prohibits the take of species listed as endangered under the Act. For species listed as threatened, section 4(d) directs the Secretary to adopt protections that are necessary and advisable to provide for the conservation of the listed species. NOAA Fisheries has promulgated 4(d) rules for all salmon and steelhead populations listed as threatened. Those rules prohibit take of fish with an intact adipose fin, except in certain circumstances where the take is part of a management action that is designed to conserve the listed species (70 FR 37160 and 71 FR 834). Hatchery managers clip the adipose fin of most hatchery salmon, thus take is not prohibited for most hatchery fish. The Ninth Circuit upheld this distinction in our 4(d) rules in *Trout Unlimited v. Lohn*, 559 F.3d 946 (9th Cir. 2009).

In addition to prohibiting the incidental take of listed salmon and steelhead through these 4(d) rules, we may also authorize otherwise prohibited incidental take through an incidental take statement issued under section 7 of the ESA. We have promulgated regulations implementing section 7 and published a handbook guiding our implementation of the regulations. The regulations create a distinction between informal and formal consultation. As described in the ESA Section 7 Consultation Handbook and our consultation regulations, if the action agency

determines that an action is “not likely to adversely affect” a listed species or designated critical habitat and we concur, the informal consultation is concluded (ESA Section 7 Consultation Handbook, pp. xv.-xvi, 3-12 (March 1998); 50 C.F.R. 402.13(a)). The Handbook provides that an action is not likely to adversely affect a species if the effects are “insignificant, discountable, or entirely beneficial” (ESA Section 7 Consultation Handbook, pp. xv.-xvi, 3-12 (March 1998)). An effect is considered “insignificant” if “based on best judgment, a person would not . . . be able to meaningfully measure, detect, or evaluate insignificant effects” (ESA Section 7 Consultation Handbook, pp. xvi, 3-13). If take will occur, informal consultation is not allowed. At the conclusion of the formal consultation we issue our biological opinion as to whether the proposed action is likely to jeopardize the continued existence of the listed species, and if necessary include an incidental take statement with terms and conditions. Thus, a finding of “no jeopardy” is different than a finding of “no significance.”

We consider Indian treaty rights along with the potential effects of harvest on ESA listed salmonids when making fishery management decisions. During settlement of the Oregon Territory, the United States negotiated treaties with various tribes, in which the tribes relinquished claims to territory. Though the terms of the treaties vary somewhat, in most of these treaties the Indian tribes reserved their right to hunt and fish in their usual and accustomed places, in common with the citizens of the territory. The United States has a unique relationship with tribes as a result of these treaties, numerous federal laws, court decisions, and executive orders. Secretarial Order 3206 (American Indian Tribal Rights, federal-Tribal Trust Responsibilities, and the Endangered Species Act) provides guidance for NOAA Fisheries in this respect. We have sought to discharge our responsibilities in part by harmonizing implementation of our ESA responsibilities with the tribes’ exercise of their treaty reserved fishing right.

With the ESA listings of salmon and steelhead, we encouraged all fisheries to be managed for the escapement of naturally spawned fish. One tool that allows harvesters to catch abundant hatchery fish while conserving naturally spawned fish is mark-selective fisheries. Hatchery fish are marked by clipping the adipose fin and selective fisheries allow only retention of fin-clipped (hatchery) fish. Naturally produced fish are released. Most treaty fisheries are prosecuted with gillnets, making mark-selective fisheries impractical in these fisheries.

While using our role as a co-manager to encourage mark-selective fisheries and other conservation practices, we have also used our authority under the ESA to promote fishing regimes that would protect and allow for the recovery of listed salmon and steelhead. In particular, as a result of the take prohibitions, no fishery may proceed without an ESA authorization if that fishery will result in takes of fish with an intact adipose fin. In the 1990’s, prior to the arrival of growing numbers of CSLs at Bonneville Dam, we began to authorize take in the fisheries through section 7 incidental take statements. As part of the section 7 process, we consulted with other federal agencies and/or with ourselves and issued a biological opinion on each proposed action. In each biological opinion we evaluated the impact of the proposed fishery on the listed salmon and steelhead species. Only where we concluded that the proposed fishery would not jeopardize the continued existence of the listed species did we issue an incidental take statement authorizing take by the fishery. We are not aware of any ESA consideration in which we found that a fishery that takes listed salmonids is “insignificant” and therefore eligible for the ESA’s informal consultation process.

In 2003 we completed a “Programmatic Environmental Impact Statement for Pacific Salmon Fisheries Management off the Coasts of Southeast Alaska, Washington, Oregon, and California and in the Columbia River Basin.” The programmatic EIS examined three alternative fishery management approaches applied to all fisheries coast-wide and in the Columbia River – fisheries as they had been previously prosecuted, without regard to ESA-listed stocks; fisheries based on escapement of naturally spawned fish and employing selective fishing methods; and a prohibition on all fisheries except those that would have no incidental take of listed fish. The EIS examined the impacts of these alternatives in all U.S. ocean and Columbia River fisheries on all listed fish species in the Columbia River Basin. Since 2003, we have prepared environmental evaluations in accordance with NEPA when authorizing the take of listed salmonids under the ESA, with the programmatic EIS as a foundation.

## **1. 2003 EA Regarding Approval of Tributary Fishery Plans in the Lower Columbia River**

In 2003, the states of Washington and Oregon submitted five Fisheries Management and Evaluation Plans (FMEPs) covering state-managed fisheries for Chinook and steelhead in tributaries of the lower Columbia River. They submitted their request for approval of the FMEPs under our ESA section 4(d) rules.<sup>5</sup> The states proposed mark-selective fisheries, enforcement measures adequate to ensure compliance, and in-season monitoring with ability to respond to in-season run size and fishery data. The five FMEPs recognized that steelhead fisheries had already been substantially reformed with the switch to mark-selective fishing methods and the release of wild fish. Harvest impacts on steelhead had already been reduced from mortality rates of 50-80% to mortality rates of less than 4% as a result of selective fishing. Harvest impacts on Chinook, which had been as high as 40-50% for some populations, were predicted to be as low as 2-5% as a result of selective fishing. Under the proposed management regime these selective practices would continue.

As part of our review of the proposed FMEPs, we prepared evaluation and determination documents for each FMEP to ensure that it adequately addressed all of the criteria in the 4(d) rule. The issuance of a determination document is a federal action and as a result we completed a section 7 biological opinion. The 4(d) determination and the section 7 biological opinion contained in-depth analyses of the effects of the proposed fisheries on listed lower Columbia River salmon and steelhead.

Our determination documents and biological opinions considered the risk to the listed species from the proposed fisheries. We found that the proposed fisheries were consistent with our approach to recovering listed populations in a number of respects. They resulted in dramatically

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<sup>5</sup> We issued a final ESA rule pursuant to section 4(d) adopting regulations necessary and advisable to conserve threatened species, including Lower Columbia River steelhead, Chinook salmon, and chum salmon. The 4(d) rule applied the prohibitions in section 9(a)(1) of the ESA, and also set forth specific circumstances when the prohibition would not apply, known as 4(d) limits. Limit 4 of the section 4(d) rule limited the application of the take prohibitions if a fishery management agency developed and implemented a FMEP that we approved under Limit 4.

reduced impacts compared to prior fishing regimes; they were managed to target hatchery fish and release naturally spawned fish (consistent with the preferred alternative in the programmatic EIS); and they included monitoring to assess impacts. The 4(d) authorization was for a limited time, allowing for further analysis and response if fish runs declined, escapements declined, or other unforeseen circumstances occurred. Thus the low levels of mortality (less than 4% for steelhead and from 2-5% for listed Chinook salmon) were predictable.

We also prepared an EA on the proposed FMEPs. The EA examined the impact of the proposed fisheries and our approval of the take associated with them on all other affected aspects of the human environment (e.g., socio-economic and cultural), and referred to the biological opinion for the in-depth analysis of the effects of the proposed fisheries on listed fish. Our decision to conclude the NEPA process with a “finding of no significant impact” and not prepare an EIS based on impacts to salmonids must be viewed in light of our detailed analysis of the proposed harvest plan in the contemporaneous ESA 4(d) determination and section 7 consultation and our consideration and evaluation of the impact of alternative fishing regimes in a programmatic EIS.

In summary, this action (1) required formal consultation, (2) complied with the criteria in the 4(d) rule, (3) did not jeopardize the continued existence of the species under the ESA, and (4) was determined to have no significant impact to the human environment under the NEPA criteria. Each of these independent determinations was made under the requirements of the statutes and applicable regulations.

## **2. 2005 EA Regarding *U.S. v. Oregon Fisheries in Columbia River Basin for 2005-2007***

### **Background on *U.S. v. Oregon Fisheries***

Fisheries in the Columbia River Basin were managed under provisions of the Columbia River Fish Management Plan (CRFMP) from 1988 through 1998. The CRFMP was a stipulated agreement adopted by the federal court under continuing jurisdiction in *U.S. v. Oregon*. The purpose of the CRFMP was to define harvest limits that would be sufficiently protective to allow for rebuilding of the stocks of concern including upriver spring and summer Chinook stocks. Prior to 1992, the CRFMP allowed harvest rates on aggregate runs (combined hatchery and wild) of up to 4.1% on upriver spring Chinook stocks in non-Indian fisheries and either 5% (for aggregate runs under 50,000) or 7% (for aggregate runs between 50,000 and 128,000) in treaty-Indian ceremonial and subsistence (C&S) fisheries. The interim management goal for upriver spring/summer Chinook was 115,000 as measured at Bonneville Dam. If the aggregate run exceeded 128,000 (or 112% of the interim management goal), half the number of fish over 128,000 was considered harvestable. If the aggregate run exceeded 143,750 fish, the entire number of fish over 143,750 was harvestable. For comparison with later management agreements, the CRFMP (which was considered conservative and adequate for rebuilding stocks at the time) allowed a harvest rate of 36.7% on an aggregate run of 180,000 fish.

In 1996, following the 1992 listing of Snake River spring Chinook under the ESA, a three-year Management Agreement modified the CRFMP harvest limits by reducing the allowable impacts in non-treaty fisheries. The tribal alternate harvest rates (5%-7%) were not changed but for the

first time the Agreement required that fisheries be managed in response to the status of listed “natural-origin” or “wild” fish rather than solely on an aggregate run size dominated by hatchery fish. The 1996 Agreement provided that harvest rates would match those of the original CRFMP only if the anticipated return of *natural origin* Snake River spring Chinook exceeded 10,000 fish but left unresolved what would happen if the aggregate run was greater than 115,000 and the return of natural origin Snake River spring Chinook was greater than 10,000. In a biological opinion accompanying the incidental take statement authorizing take by fisheries under the revised plan, we recognized that the proposed fisheries would adversely affect listed Snake River spring/summer Chinook, but also acknowledged that the listed fish would not reach target escapement levels even with no fisheries. We approved the proposed fisheries, acknowledging that non-treaty fisheries were approaching zero and that it was appropriate to allow some level of fishing to meet tribal ceremonial and subsistence needs.

The Basinwide Salmon Recovery Strategy, adopted by federal agencies in 2000, provided a broader context for consideration of harvest-related mortality. The Recovery Strategy confirmed that conservative management policies were essential for an interim period while survival improvements are made in other sectors, but that at some point further reductions in harvest were unlikely, by themselves, to result in recovery. The Recovery Strategy articulated: (1) the need to balance the conservation of at-risk species with the federal government’s treaty obligations to tribes; (2) the priority of tribal fishing rights with respect to non-treaty fisheries; (3) a willingness to accept an increased level of risk associated with tribal fishing; and (4) the idea that there is an “irreducible core” of tribal harvest that is so vital to the treaty obligation that the federal government will not eliminate it.

As the 2000 fishing season approached, we listed upper Columbia River spring Chinook as endangered under the ESA. The 2000 preseason forecast for upriver spring Chinook (Columbia and Snake River hatchery/wild stocks combined) was higher than it had been for some time at 134,000 (NMFS 2005 (F/NWR/2005/00388)). Upriver spring Chinook run sizes in 1994 and 1995 were the lowest on record at 21,100 and 10,200 respectively and the 1998 and 1999 runs were near record lows at 38,400 and 38,700 respectively (ODFW/WDFW 2002). Based on the higher projected 2000 run size, the tribes proposed a treaty Indian harvest rate for spring Chinook of 9% while the states proposed a non-treaty harvest rate of 1-2% (10 to 11% total). In spite of intense negotiations that continued through the consultation period, NOAA Fisheries concluded a combined harvest rate in excess of 9% was inappropriate given the status of the stocks and issued a jeopardy opinion that limited the combined harvest rate to 9%.

In 2001, the preseason forecast for upriver spring Chinook increased to 364,000 fish – the highest projected return since 1979. The parties to *U.S. v Oregon* reached an Interim Management Agreement for mainstem fisheries that remained in effect to 2005. The Interim Agreement established a variable harvest rate schedule based on a combination of total aggregate run size (hatchery and wild upper Columbia spring Chinook, Snake River spring/summer Chinook) and natural origin Snake River spring/summer Chinook run size. The sliding scale harvest rate schedule limited harvest impacts on wild upriver spring Chinook, from all in-river fisheries combined, to less than 5.5% at low run sizes (less than 25,000) and to no more than 17% when run sizes are large (450,000 and above). The harvest rate impact schedule is divided between treaty and non-treaty fisheries. The treaty share of harvestable surplus hatchery fish is

50%. A primary objective of the parties to the Management Agreement is to ensure that the tribes have adequate opportunity to exercise their right to fish and harvest their share, which includes an annual ceremonial and subsistence entitlement of 10,000 Chinook. Accordingly, an allocation of harvest impacts, from the sliding scale upriver spring Chinook harvest rate schedule, is secured for treaty fisheries first. Under this allocation harvest impacts from treaty fisheries range from 5% for run sizes less than 25,000 to 15% of wild upriver Chinook when run sizes are 450,000 or larger. The remaining 0.5% to 2.0% of harvest impacts is then allocated to non-treaty commercial and recreational fisheries. Non-treaty fisheries (both commercial and recreational) are mark-selective and harvest impacts from these fisheries are limited to incidental handling mortality.<sup>6</sup>

## **2005 EA**

Under the management regime for *U.S. v. Oregon* fisheries, harvest impact limits are determined before the start of the each spring fishing season based on run size projections. Harvest allocations are not fixed prior to the season, however, and adjustments to the allotted impact rates, including complete fishery closures, can be implemented during the fishing season if runs do not meet pre-season projections. In our 2005 ESA Section 7 biological opinion accompanying our authorization of the take associated with this fishing regime, we cited two factors that were important in reaching a no jeopardy conclusion for upriver spring Chinook; (1) the short duration of the agreement; and (2) the introduction of lower harvest rates for low run size years (NMFS 2005).

In 2005, we consulted under ESA section 7 and issued an incidental take statement covering the proposed interim harvest regime on *U.S. v. Oregon* fisheries for 2005-2007. The interim harvest regime continued the sliding scale harvest rates that would result in combined harvest impacts of 5.5% at low run sizes, increasing to 17% at high run sizes. In addition to the sliding scale harvest rate, the programs included monitoring provisions designed to ensure that fisheries did not exceed the proposed harvest rates. Our authorization of the potential take associated with this fishery was through a section 7 incidental take statement and not through the 4(d) rule (as described above for the 2003 FMEP) thus we did not prepare a section 4(d) determination package. We did conduct an in-depth review of the impact of the proposed fisheries on listed species through the section 7 consultation process. Our section 7 consultation also relied on the extensive prior analysis of these fisheries in our earlier section 7 consultation.

In our section 7 analysis, we considered the risk to the listed species from the proposed fisheries. The proposed fisheries were consistent with our approach to recovering listed populations in a number of respects. They resulted in reduced impacts compared to prior fishing regimes; they

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<sup>6</sup> The sliding scale harvest rate schedule has been reviewed periodically and was adopted with modifications for the period 2008-2017. The harvest impact rate allocations between the treaty and non-treaty sectors have been changed slightly but the overall limits remain within the 5.5% to 17%. The harvest rate for the non-treaty sector has been further reduced to protect very depressed runs (<27,000 fish) (Joint Staff 2011).

adopted a harvest rate scale based on the abundance of naturally spawned fish and designed to provide adequate escapement of naturally spawned fish. In particular, harvest rates were lower in years of lower fish runs. Non-treaty fisheries were managed to target hatchery fish and release naturally spawned fish (consistent with the preferred alternative in the programmatic EIS). The proposed program included monitoring during the fishing season and suspension of fishing if the expected impacts were likely to be exceeded. The incidental take statement was for a limited time, allowing for further analysis and response if fish runs declined, escapements declined, or other unforeseen circumstances occurred.

In addition to conducting an in-depth analysis of impacts of issuing the incidental take statement on listed species through a section 7 consultation, we also conducted an environmental review under NEPA, consistent with the court's decision in *Ramsey v. Kantor*. We completed an EA that examined the impact of the proposed fisheries and our approval of the take associated with them on all other affected aspects of the human environment. The EA referred to the biological opinion for the in-depth analysis of the effects of the proposed fisheries on listed fish. At the conclusion of our evaluation we issued a FONSI under NEPA.

The prospective harvest rate schedule adopted in the Agreement is similar to that first used in 2001 and during the 2005-2007 Interim Agreement (NMFS 2008b). For run sizes less than 82,000 fish the non-treaty harvest rate is limited to 0.5 to 1.6% but if the upper Columbia River natural spring Chinook forecast is less than 1,000 fish the non-treaty allowable harvest is capped at 1.5% and goes down more quickly.

A significant feature of the *U.S. v. Oregon* harvest regime is that as run sizes decrease, so do harvest rates. The purpose of this approach is to ensure that enough wild adults escape in each generation to produce the next generation of fish. In addition, we encouraged all fisheries to eliminate or minimize the take of wild listed salmonids while harvesting hatchery adults. Non-treaty harvest is almost exclusively limited to hatchery fish, and every effort is made to release wild listed fish back into the river so that they have the potential to spawn and contribute to the productivity of the species. For example, the non-treaty commercial fisheries utilize tangle net gear which allows release of wild listed salmonids. Recreational non-treaty fisheries also require release of wild fish to the river as soon as they are caught. With respect to treaty harvest, we have actively encouraged the tribes to move to mark-selective fisheries in order encourage the harvest of hatchery fish while minimizing the take of wild listed fish. At the same time, we recognize the treaty right and the tribes' desire to maintain traditional fishing methods and have reasonably harmonized these competing interests with protective management regimes.

### **3. 2007 EA Regarding Approval of Five FMEPs in Middle Columbia River Tributary Fisheries**

In 2007, the states of Oregon and Washington submitted FMEPs governing mid-Columbia River tributary fisheries for approval under the 4(d) rule. As in the lower Columbia, the states proposed to continue mark-selective fisheries, enforcement measures adequate to ensure compliance, and in-season monitoring with ability to respond to in-season run size and fishery data. Prior to the implementation of mark-selective fisheries, harvest rates for some populations of mid-Columbia

steelhead had ranged from 50-80%. Under the proposed FMEPs, harvest rates for adults in all populations were not expected to exceed 10%. The FMEPs set different fishing seasons for the 20 populations based on each population's conservation needs. For example, no harvest would be allowed on the four populations in the Yakima River basin and one population in Fifteenmile Creek.

Our analysis of the proposed FMEPs considered the risk to the listed species from the proposed fisheries. We concluded that the proposed FMEPs were consistent with our approach to recovering listed populations in a number of respects: they resulted in dramatically reduced impacts compared to prior fishing regimes; they were managed to target hatchery fish and release naturally spawned fish (consistent with the preferred alternative in the programmatic EIS); they were managed to protect weak stocks in specific tributaries; and they included monitoring to assess impacts. The 4(d) authorization was for a limited time, allowing for further analysis and response if fish runs declined, escapements declined, or other unforeseen circumstances occurred. Thus the low levels of mortality (less than 1% for some populations and less than 10% for others) were predictable and could be controlled by active management.

In addition to conducting an in-depth analysis of impacts of issuing a 4(d) approval, we also conducted an environmental review under NEPA. The EA examined the impact of the proposed fisheries and our approval of the take associated with them on all other affected aspects of the human environment, and referred to the biological opinion for the in-depth analysis of the effects of the proposed fisheries on listed fish.

#### **4. 2007 EA for Pacific Coast Salmon Plan Amendment 15: An Initiative to Provide De Minimis Ocean Fishing Opportunity for Klamath River Fall Chinook**

Klamath River fall Chinook are not an ESA-listed species. They are managed by the Pacific Fishery Management Council (Council) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act to achieve maximum sustainable yield.<sup>7</sup> They are a major contributor to ocean fisheries off California and Oregon, and in the Klamath River. The conservation objective for Klamath River fall Chinook in the Council's Salmon Fishery Management Plan requires that fisheries be managed each year for a return of 33-34% of potential adult natural spawners, but no fewer than 35,000 naturally spawning adults. This means that fisheries are managed subject to an exploitation rate that ranges from a maximum of 67% when abundance is high to a minimum of zero if the anticipated return is less than 35,000. Although Klamath River fall Chinook are not listed under the ESA, in ocean harvest management they serve as a surrogate for the purpose of managing impacts on California coastal Chinook, which are listed under the ESA.

In 2007, the Council proposed Amendment 15 to the Pacific Coast Salmon Fishery Management Plan. The purpose of Amendment 15 was to modify the conservation objective for Klamath

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<sup>7</sup> *MSY* is defined as "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets." 50 C.F.R. § 600.310(e)(i)(A).



River fall Chinook to allow some ocean fishing when the anticipated escapement was projected to be below 35,000. Amendment 15 allowed a harvest rate of 10% when the anticipated escapement is between approximately 30,000 and 35,000 with further reductions in harvest if anticipated returns decline further.

The Council assessed the impact of the alternatives in a 2007 EA, including an alternative using a sliding scale harvest impact for runs under 35,000 fish, using population viability models. Impacts were modeled over a 5-year and a 40-year timeframe. The models predicted that under the status quo fisheries, there was a 27% chance of escapement falling below 35,000 fish, while under the preferred alternative there was a 30% chance. For listed California coastal Chinook, with status quo fisheries there was a 39% chance of exceeding target harvest levels, while the preferred alternative had a 40% chance of exceeding target harvest levels. The EA concluded that the increase in the risk of not meeting the target escapement goal was relatively low and therefore did not threaten the long-term productivity of Klamath River fall Chinook.

## **5 Different Standards under NEPA and MMPA**

There are relevant distinctions among the purposes and policies of NEPA and the MMPA. NEPA requires a consideration of whether a proposed action constitutes a “major federal action significantly affecting the quality of the human environment . . .” (42 U.S.C. § 4332(C)). NEPA’s inquiry is on effects of a proposed action on the “human environment,” which is defined broadly by regulation to mean “. . . the natural and physical environment and the relationship of people with that environment” (40 C.F.R. § 1508.14). In addition, NEPA’s regulations require an agency to consider “cumulative effects,” which is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions . . .” (40 C.F.R. § 1508.27). Finally, the term “significantly” as used in NEPA requires consideration of “context” and “intensity” and the determination is informed by a multitude of factors (40 C.F.R. § 1508.27). NEPA’s implementing regulations also provide explicit guidance to federal agencies concerning the preparation of environmental documents (such as consideration of alternatives, development of environmental consequences, how to address incomplete or unavailable information, etc.). Thus, NEPA and its implementing regulations focus broadly on numerous elements of the human environment. This is in contrast to MMPA Section 120, which focuses on a very narrow and specific question: whether pinniped predation is having a significant negative impact on the decline or recovery of at-risk salmonids.

In the decisions discussed above we concluded, based on our evaluation of NEPA’s broad mandate and significance criteria (“context” and “intensity”), that the harvest rates were acceptable limits to ensure the conservation and recovery of salmonids, while also providing socio-economic and cultural benefits. As a result, we concluded that none of the above fishery harvest actions would result in a significant impact for purposes of NEPA. Nevertheless, the agency also recognized that adverse effects would result from the harvest of specified percentages of the listed salmonid stocks (for example, the 2005 FONSI states that ESA listed salmonids will be adversely affected by the proposed action (NMFS 2005)).

In our NEPA analyses we broadly considered the impacts of the proposed fisheries on all resources in the human environment. The finding under NEPA, that there was no significant impact, was made under the NEPA guidelines and in light of the fact that we had thoroughly analyzed impacts on the human environment in general in a programmatic EIS (for *U.S. v. Oregon* fisheries), and on listed salmonids in particular under the authority of the ESA. Because of those detailed ESA evaluations, there was reduced uncertainty about the impacts of the proposed fisheries on the listed species. Moreover, in the ESA reviews we had concluded that the fisheries would not impede the ability of the listed species to survive and recover.

In the MMPA determination, we focus exclusively on the interplay between pinnipeds and at-risk salmonids and the effect of lethally removing individually identifiable predatory pinnipeds. (In a companion NEPA document, we also evaluated impacts of our proposed action on target and non-target species and other elements of the affected human environment.) Under the MMPA inquiry, we consider that the constant rate of pinniped predation on at-risk salmonids imposes a significant risk on the ability of the at-risk salmonid species to survive and recover, particularly because of our inability to control the predation and the effect of a constant level of pinniped predation on at-risk populations when run sizes are low. In addition, we evaluated the effect of removing 30 CSLs per year, or even up to 92 CSLs per year, and concluded that such removals would have no effect on the overall range-wide abundance, distribution, and productivity of the CSL population because the number of sea lions removed will be extremely small compared to the number of animals that can be safely removed from the population without affecting its status with respect to optimum sustainable population.

## **6. Summary: Consideration of Prior Agency Decisions Does Not Change the Conclusion that Pinnipeds are Having a Significant Negative Impact on At-Risk Salmonids**

The risks to salmonids from uncontrolled pinniped predation are in contrast to the risks from managed human harvest in many respects. While both sources of mortality are measurable, mortality from fisheries has been sharply reduced, while pinniped predation has grown. Fisheries are heavily regulated, while pinniped predation is currently unmanaged and could continue to increase if not addressed. This presents an unmanaged and substantial risk to listed salmonids. In contrast, all fisheries can be terminated immediately when unforeseen circumstances warrant. Fisheries are monitored and enforced, with adjustments made in season as warranted, while pinniped predation is difficult to monitor and requires years of management to achieve results.

Although both sources of mortality have a measurable effect on the numbers of listed adult salmonids contributing to the productivity of the affected ESUs/DPSs, abundance-based harvest has a “compensatory” effect (taking advantage of favorable survival conditions to harvest excess fish, and minimizing harvest removals when run sizes are low), while pinniped predation has a depensatory effect (increasing the risk of populations entering an “extinction vortex” at low run sizes) (Ferguson pers. comm 2011). In addition, the pinniped predation occurs disproportionately on early and late arriving fish. The best available information shows that these fish are from discrete populations, with the result that pinniped predation is having a disproportionate impact on those populations (Ferguson pers. comm 2011).

In Section III.C. above, we describe modeling methods in development by the Northwest Fisheries Science Center in collaboration with other salmon scientists in the region to better analyze the potential impact of various management actions on the likelihood that salmonid populations will achieve recovery targets. We specifically asked the Center to model the impacts of recent levels of pinniped predation on extinction risk of Snake River spring/summer Chinook, one of the ESUs affected by pinniped predation at Bonneville Dam. As noted in section III.C. above, the results from this modeling are too preliminary and inconclusive to provide reliable estimates on the absolute impact of pinniped predation. Some early model runs do suggest, however, that current levels of pinniped predation and the harvest regime under U.S. v. Oregon may have roughly equivalent effects on extinction risk. This preliminary result needs to be further tested as the models are refined. If these initial results are confirmed, it could trigger re-initiation of consultation under the ESA of related harvest which, in turn, could lead to further analysis under NEPA. However, none of these potential outcomes undermine the conclusion that pinniped predation is having a significant negative impact on at-risk salmonids, as we interpret that standard under Section 120 of the MMPA.

## **B. Prior Agency Decisions Regarding Management of the Federal Columbia River Power System**

A joint biological assessment on the Effects of the FCRPS and Mainstem Effects of Other Tributary Actions on Anadromous Salmonid Species Listed under the Endangered Species Act (August 2007) was prepared by the COE, Bureau of Reclamation (Reclamation), and the Bonneville Power Administration (BPA).

The COE and Reclamation are authorized by Congress to operate and maintain multi-purpose hydroelectric projects as the federal Columbia River Power System (FCRPS). The BPA is responsible for marketing and transmitting the power generated from these projects. Since the first salmon listings in the early 1990s, these agencies have engaged in numerous ESA consultations regarding the impacts of their projects and operations on Columbia Basin listed salmonids. In 2000, we issued an opinion concluding that FCRPS operations and maintenance jeopardized the continued existence of all the upriver stocks, and we issued an RPA. Our consistent conclusion with respect to the operation of the FCRPS has been that its impacts are significant. We issued a jeopardy opinion and reasonable and prudent alternative in 2000, which was invalidated and remanded by the Oregon federal District Court in 2003. We issued another biological opinion in 2004, which was also invalidated by the District Court, which was affirmed by the Court of Appeals in 2005. In 2008, we issued another biological opinion (NMFS 2008b) which found jeopardy and recommended a RPA calling for performance standards at the hydropower projects ensuring a minimum survival rate for migrating salmon, restoration actions for spawning and rearing habitat, hatchery reforms and detailed research, monitoring and evaluation concerning the effects of the FCRPS on listed salmonids and their current status. In 2010, at the direction of the court, we issued a supplemental biological opinion for the FCRPS

that integrated the 2008 biological opinion and Adaptive Management and Implementation Plan.<sup>8</sup> In 2011 the district court remanded these opinions to us to address certain issues (*NWS v. NMFS*, Civ. No. CV 01-640-RE (D. Oregon)).

Passage of juvenile salmonids through the hydropower system results in substantial mortality rates. The juvenile mortality is well documented. Some of the sources are well understood and have been greatly reduced (for example dam passage mortality of juveniles) while others are less well understood. For the mortality that cannot be eliminated through improved structures or operations, our RPA required mitigation in other areas.

In our role as the consulting agency under the ESA, we have never made a finding, or implied, that the existence and operation of the FCRPS has an insignificant impact on at-risk salmonids. To the contrary, our findings have been at the other end of the spectrum – that FCRPS structures and operations, without the currently prescribed mitigation, jeopardize the continued existence of listed species. In addition, as in the case of fisheries, the risks from the FCRPS are monitored, managed, and subject to corrective action. Our RPAs have required the FCRPS agencies to take off-site actions that mitigate the unavoidable impacts of the operation of the FCRPS and that will collectively avoid jeopardy to the species. The actions being taken under the 2008 opinion are focused on improving fish survival at federal dams and throughout the salmon life cycle, incorporating information from recovery plans. The opinion calls for increasing survival rates of fish passing through the dams; managing water to improve survival; reducing numbers of juvenile and adult fish consumed by avian, fish and marine mammal predators; improving juvenile and adult fish survival by protecting and enhancing tributary and estuary habitat; implementing safety net and conservation hatchery programs; and ensuring that hatchery operations do not impede recovery. These attributes are in stark contrast to the risks from pinnipeds, which are not managed, are difficult to monitor, and have not been successfully mitigated.

In addition, the predominant adverse effect from the existence and operation of the FCRPS is mortality to juveniles during their migration out to the estuary and ocean. While juvenile mortality is important and naturally much higher than at other life stages, the fecundity of salmonid species works to offset the mortality at this life stage in an unperturbed environment or when other threats are controlled. This is particularly true when ocean rearing conditions are

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<sup>8</sup> Our 2008 BiOp and 2010 Supplemental BiOp for the FCRPS adopted and strengthened a reasonable and prudent alternative (RPA) that we concluded was sufficient to avoid jeopardy and adverse modification of critical habitat for thirteen species of salmon or steelhead affected by the FCRPS. Our RPA identified performance standards for FCRPS actions to limit or offset adverse effects on the listed species and adverse modification of their critical habitat during its ten year term. The actions being implemented under the 2008 BiOp are focused on improving fish survival at federal dams and throughout the salmon lifecycle, incorporating information from recovery plans to address such limiting factors for these species. The program calls for increasing survival rates of fish passing through the dams; managing water to improve fish survival, reducing the numbers of juvenile and adult fish consumed by fish, avian, and marine mammal predators; improving juvenile and adult fish survival by protecting and enhancing tributary and estuary habitat; implementing safety net and conservation hatchery programs to assist recovery; and ensuring that hatchery operations do not impede recovery.

favorable for fish that have survived the early threats and successfully migrated to sea. Overall, the most visible measure of success for any mitigation is an adequate return of reproducing adult salmonids over time. The impact of dams and fish passage facilities to returning adults is relatively low and predictable. Pinniped predation at the dam targets returning adults immediately prior to their opportunity to spawn and reproduce after they have survived the majority of natural and human caused threats.

The current recovery strategy does not rely upon comparisons of mortality between sources or within or across life stages but rather focuses on improved survival from all threats at all life stages. Comparing juvenile mortality attributable to the hydrosystem to adult pinniped predation provides no benefit for the survival of salmonids from either threat and presents a complex challenge for gauging the relative importance of either risk because it evaluates different life stages with markedly different survival potential. In addition, the existence of uncontrolled pinniped predation is in direct conflict with the mitigation goals presented in the 2008 biological opinion and undermines efforts being made to reduce the impacts across a host of threats to avoid jeopardizing the continued existence of listed salmonids in the Columbia River.

Accordingly, our approach in the FCRPS context is not at odds with our need to manage pinniped predation under the MMPA. Both result in adverse impacts to at-risk salmonids. However, similar to fishery harvest actions, hydropower activities can be (and currently are) managed to minimize impacts on various salmonid life stages, whereas pinniped predation is an unmanaged and unchecked source of mortality.

### **C. Elimination of 1% Predation Rate**

The inclusion of a 1% predation rate threshold for suspending sea lion removals (2008 LOA Condition 15) is unnecessary and we propose to eliminate it. We propose instead at the conclusion of the 5-year authorization to assess predation trends to determine whether the lethal removal authorization should continue.

When the task force submitted its recommendations in 2007, it responded to several questions we had prepared. A “guiding principle” established by the task force was “to remove the minimum number of CSLs necessary to affect and reduce the number of CSL recruits to the area below Bonneville Dam by using non-lethal and lethal actions over the long term.” Under this guiding principle the Task Force recommended, as an interim goal, that CSL predation on salmonids in the observation area be reduced to a rolling three-year average of 1% within six years. The task force noted explicitly that the 1% value was chosen only as an interim criterion because there was insufficient information to provide a quantitative level of predation to distinguish between significant and insignificant impacts on salmonids. The task force suggested that 1% would be substantially closer to a historical rate of predation than is observed more recently, and the historical predation rate was believed to be greater than zero.

We used the task force's recommendation of a 1% predation rate as a limit on the number of sea lions that could be removed from the Bonneville Dam area to protect salmonids (the task force recommended an annual limit of 1% of the PBR of CSLs, or the number of removals necessary

to achieve an observed average predation rate of 1% of the adult salmonids tallied by fish counters over 3 years, whichever was lower). We incorporated that recommendation into our authorization, establishing a threshold of 1% predation rate as an additional limit on the number of sea lions that could be removed under the authorization. The Marine Mammal Commission (letter dated February 19, 2008) interpreted this limit to suggest that 1% predation rate is a threshold between significant and insignificant levels of predation. However, we stated in our Decision Memorandum for the 2008 authorization:

This recommendation is not the equivalent to a finding that a 1% predation rate represents a quantitative level of salmonid predation that is "significant" under section 120, and that less than 1% would no longer be significant. Rather, it is an independent limit on the numbers of sea lions that can be lethally removed to address the predation problem and is intended to balance the policy value of protecting all pinnipeds, as expressed in the MMPA, against the policy value of recovering threatened and endangered species, as expressed in the ESA.

We considered it reasonable to limit removal of sea lions to a level no more than would be required to achieve the task force's recommended interim criterion of a *3-year average maximum predation rate of 1%*. (emphasis added).

The Ninth Circuit concluded, "[t]he finding that predation at the 1percent level is significant is not adequately explained." *HSUS v. Locke*, 626 F.3d at 1053. The Court afforded us the opportunity either to articulate a reasoned explanation for our action or to adopt a different action with a reasoned explanation that supports it.

On further consideration, we have eliminated the 3-year average predation rate threshold for the following reasons:

(1) The 1% predation rate threshold is unnecessary for the protection of the California sea lion population because the 1% of PBR limit is adequate to ensure that the removal program would have inconsequential effects on the sea lion population. As described in more detail above, the California sea lion population is large and growing and the removal of even the full number of animals representing 1% of PBR (92) will have no effect on the status of the California sea lion population.

(2) The 1% predation rate threshold is unnecessary because it is unlikely that the threshold will be achieved over the 5-year term of the proposed action. The 3-year running average predation rate by pinnipeds on salmonids has exceeded the 1% threshold every year since 2005. In 2011 the U.S. Army Corps of Engineers (Corps) summarized the data on the observed predation rate and observed fish passage at the dam from 2002 through 2011 (Stansell et al. 2011). Salmonid passage totals for the January 1 through May 31 spring seasons in 2008, 2009, and 2010 (the first three years of the 2008 authorization) were reported as 147,543, 186,060, and 267,194 fish respectively. Predation rates for the same period were reported as 4,466 salmonids (2.9% of the run) in 2008, 4,489 (2.4%) in 2009, and 6,081 (2.2%) in 2010. The 3-year running average predation rate for 2008-2010 was thus 2.44%. In 2011 the predation rate dropped to 1.6%, bringing the 3-year running average to 2.04%, which again exceeded the threshold. At current

levels of pinniped predation (6,000 salmonids consumed in 2010 and 3,500 in 2011), consistent run sizes of 350,000 to 600,000 fish would be needed to achieve a 1% threshold, which is unlikely, given that the 2002-2011 average is well below 200,000. Conversely, if run sizes were 250,000, a 1% predation rate would equate to 2,500 fish. This level of predation was last seen in 2003. Although the removal program in 2008-2010 may have led to lower predation levels in 2011 (Stansell et al. 2011), even the reduced predation rate in 2011 exceeded 1% of the salmon run. Based on this past data, it is unlikely that the 3-year average predation rate of 1% would be achieved over the course of the 5-year authorization.

(3) If the threshold is achieved and lethal removals are suspended, the predation rate can quickly escalate again. Although it is unlikely the predation rate would drop to a 1% 3-year average during the term of the 5-year authorization (for the reasons discussed above), even if it did the history of predation at Bonneville Dam demonstrates that the predation rate is likely to quickly rise again, as sea lion numbers and per capita consumption increase. In that event, the lethal removals would resume. Rather than have the program start and stop based on fluctuation around a set threshold, we have concluded that it would be more meaningful to instead rely on a 5-year retrospective review at the end of the authorization period and consider all the circumstances, including California sea lion abundance, salmonid run size, and any other relevant factors.

During the period (2008-2010) when sea lion removals were conducted at Bonneville Dam, accompanied by intense non-lethal deterrence, numbers of salmonids taken by CSLs at the Dam continued to rise. Therefore, there is no reasonable expectation that a specific predation rate can be achieved at the rate of removal implemented to date. Accordingly, instead of the 1% predation threshold, we, the Corps, and state resource agencies will monitor predation levels throughout the five-year authorization period and will consider, in either 2015 or 2016, whether for example, the absolute number of salmonids killed by California sea lions in a season is lower than the preceding season and if there has been a declining trend in predation (i.e., the number of salmonids killed per season declines over consecutive seasons). The purpose of the consultation will be to assess inter-annual changes in the pertinent data and determine, after the five-year period of the authorization, whether the program has been effective and whether it should be continued. We also intend, following the expiration of the authorization, to reconvene the Task Force whose purpose will be to evaluate the effectiveness of the 2012-2016 program and recommend whether it has or has not been effective in eliminating the problem interaction.

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