

**Endangered Species Act Section 7(a)(2) Consultation
Supplemental Biological Opinion**

**Consultation on Reducing the Impacts on At-risk Salmon and Steelhead by California Sea Lions in
the Area Downstream of Bonneville Dam on the Columbia River, Oregon and Washington**

NMFS Consultation Number: WCR-2016-4754

Action Agencies:

U.S. Army Corps of Engineers
Bonneville Power Administration
National Marine Fisheries Service

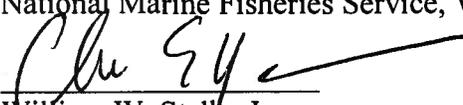
Affected Species and Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely to Jeopardize Species?	Is Action Likely to Destroy or Adversely Modify Critical Habitat?
Upper Columbia River spring-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	Endangered	Yes	No	No
Snake River spring/summer run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	Threatened	Yes	No	No
Columbia River chum salmon (<i>Oncorhynchus keta</i>)	Threatened	Yes	No	No
Lower Columbia River coho salmon (<i>Oncorhynchus kisutch</i>)	Threatened	Yes	No	No
Snake River sockeye salmon (<i>Oncorhynchus nerka</i>)	Endangered	Yes	No	No
Lower Columbia River steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Yes	No	No
Middle Columbia River steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Yes	No	No
Upper Columbia River steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Yes	No	No
Snake River Basin steelhead (<i>Oncorhynchus mykiss</i>)	Threatened	Yes	No	No
Green sturgeon Southern DPS (<i>Acipenser medirostris</i>)	Threatened	No	No	No
Eulachon Southern DPS (<i>Thaleichthys pacificus</i>)	Threatened	No	No	No

Consultation Conducted by:

National Marine Fisheries Service, West Coast Region

Issued by:


 For William W. Stelle, Jr.
 Regional Administrator

Date Issued:

June 23, 2016

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1. INTRODUCTION

This supplemental biological opinion (supplemental opinion) and the incidental take statement portions of this document were prepared by the National Marine Fisheries Service (NMFS) in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, *et seq.*), and implementing regulations at 50 CFR 402.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554).

The States of Oregon, Washington, and Idaho's (States) have applied for authority, pursuant to § 120(a) of the Marine Mammal Protection Act (MMPA) to lethally remove nuisance California sea lion (*Zalophus californianus*) from the Columbia River in the vicinity of Bonneville Dam. This supplemental opinion considers the effects of NMFS' authorization of that program, through June 30, 2021, and its compliance with the standards of § 7(a)(2) of the Endangered Species Act (ESA). NMFS is hereby supplementing the science and conclusions of its March 11, 2008 (2008 opinion), February 20, 2009 (2009 opinion), and February 29, 2012 (2012 opinion) opinions for NMFS' MMPA authorization as well as the provision of program funding to the States by NMFS, the Bonneville Power Administration (BPA), and the U.S. Army Corps of Engineers (Corps).

On March 18, 2008, we (NMFS) issued a Letter of Authorization (LOA) to the States authorizing them to remove certain California sea lions having a significant negative impact on at-risk ESA listed salmon and steelhead (*Onchorhynchus spp.*). That finding was made under Section 120 of the MMPA. Before the MMPA determination was made, we also completed reviews under the National Environmental Policy Act (NEPA) and the ESA. Our action immediately faced legal challenge. On November 23, 2010, the U.S. Court of Appeals for the Ninth Circuit (Ninth Circuit) instructed the district court to vacate our lethal removal authorization and remand the decision to us for further explanation. The States' again requested authorization to lethally remove California sea lions from the Columbia River on December 7, 2010.

We reviewed the instructions from the district court, evaluated the States' request, and on May 12, 2011, we issued another LOA to the States. In doing so, we also provided the additional explanation required by the district court, prepared a NEPA Supplemental Information Report, and prepared a memorandum addressing ESA consultation for the proposed authorization. The 2011 LOA was challenged in Federal district court in Washington, D.C. The plaintiffs alleged, similar to the 2008 lawsuit, that our issuance of the Section 120 Letter of Authorization violated the MMPA and NEPA. To ensure full compliance with all procedural requirements of Section 120, we notified the States on

July 26, 2011, that we were withdrawing the 2011 LOA. The plaintiffs voluntarily dismissed their lawsuit after learning that we withdrew the LOA.

On August 18, 2011, the States submitted a new request for the lethal removal of California sea lions 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. We reconvened the Pinniped-Fishery Task Force (Task Force), as required under the MMPA in October 2011 to evaluate the states' application and public comments and to recommend whether we should approve or deny the proposed intentional lethal taking program. The Task Force's final report and recommendation were produced on November 14, 2011. On March 15, 2012, we issued the current LOA to the States. In September 2013, the Ninth Circuit affirmed and upheld our action to grant the States the 2012 LOA, which is set to expire June 30, 2016.

1.1 Consultation History and Background

Over the past decade, NMFS has granted funding to the Pacific States Marine Fisheries Commission to work with the Oregon Department of Fish and Wildlife (ODFW) and the Washington Department of Fish and Wildlife (WDFW) to reduce pinniped predation on ESA-listed adult salmonids passing Bonneville Dam. Similarly the states have received funding from BPA, and participation by the Corps, in conjunction with their implementation of the Federal Columbia River Power System (FCRPS) reasonable and prudent alternative (RPA) actions 49 and 69. In 2006 and 2007, we consulted with ourselves on the funding of that grant; we also consulted with the Corps who also funds and conducts (in partnership with ODFW and WDFW) non-lethal sea lion deterrence activities at Bonneville Dam. These consultations resulted in findings of "not likely to adversely affect" ESA-listed salmonids or their designated critical habitat, or adversely affect Magnuson-Stevens Fishery Conservation and Management Act (MSA) essential fish habitat [consultation #s 2006/00481, 2006/01021, 2007/00896, 2011/05874]. In 2006, the States applied for authority to lethally take, by intentional means, individually identifiable California sea lions in accordance with Section 120 of the MMPA in the vicinity of Bonneville Dam. We again consulted with ourselves on both the actions previously analyzed and on partially granting the States' application and reached a finding of not likely to jeopardize the continued existence of threatened or endangered salmonids or adversely modify their designated critical habitat, or adversely affect MSA essential fish habitat [consultation # 2008/00486].

During the first year of implementation of the 2008 LOA, an accident occurred and two Steller sea lions died. Section 7 consultation was reinitiated and procedural modifications were adopted to reduce the likelihood of future mortality. The modified procedures were analyzed, and a revised 2009 opinion and incidental take statement were prepared [consultation # 2008/08780]. The action and environmental conditions that provided the basis for the detailed description of the proposed action, action area, status of species and critical habitat, environmental baseline, and effects analysis including

cumulative effects, as presented in the 2009 opinion were substantially unchanged, except for the minor updates presented in the 2012 opinion [consultation # 2011/05874].

On December 4, 2013, the eastern Distinct Population Segment (DPS) of Steller sea lions were removed from the list of endangered and threatened wildlife (78 FR 66140). Therefore, effects of the action on Steller sea lions will not be considered further in this opinion.

The action and environmental conditions that provided the basis for the detailed description of the proposed action, action area, status of species and critical habitat, environmental baseline, and effects analysis including cumulative effects, as presented in the 2012 biological opinion are substantially unchanged, and are incorporated herein by reference (F/NWR/2011/05874).

1.2 Proposed Action

Summary of the Proposed Action and Relationship of the Anticipated Impacts from the Action to the 2008, 2009, and 2012 Opinions

On January 27, 2016, we received an application under section 120 of the MMPA from the States requesting a five-year extension of the 2012 LOA, with no changes or modifications to the terms and conditions of the LOA, to intentionally take, by lethal methods, individually identifiable California sea lions that are having a significant negative impact on Pacific salmon and steelhead listed as a threatened or endangered under the ESA in the vicinity of Bonneville Dam, through June 30, 2021. The purpose of this document is to supplement the 2012 opinion pursuant to ESA Section 7(a)(2) for each species, the designated critical habitat affected by the pinniped removal program. In doing so, NMFS is using the best scientific information available and taking into account the first eight years of the pinniped removal program's implementation.

Proposed Action

The proposed action is to approve the States' January 27, 2016, request for authorization to conduct a sea lion lethal removal program, with terms and conditions as described in the request which is identical to the program previously authorized in the 2012 LOA. The proposed sea lion removal program at Bonneville Dam includes two types of actions that may affect listed salmonids, green sturgeon, and eulachon. They are: (1) lethal removal of California sea lions, and (2) non-lethal deterrence of all pinnipeds, as described below. These actions would occur annually for a period of five years, 2017 through 2021. The core period of operation of shore- and boat-based non-lethal deterrence would take place from early March through early June, but removal of individually identified predatory sea lions, as proposed by the States' and authorized by NMFS under Section 120 of the MMPA, may occur at any time.

Lethal Removal of California Sea Lions

The States may not remove (i.e., kill or place in permanent captivity) more than 1 percent of the potential biological removal level (PBR) annually. The current PBR for the U.S.

population of California sea lions is 9,200 (Carretta et al. 2013¹), and Carretta et al. 2015). Those animals would be removed from the action area described in the aforementioned opinions by (1) catching them in a trap (a floating dock-like structure that animals jump onto to rest and dry off) and either placing them in a display facility or killing them with lethal injection or gunshot, or (2) shooting them in the area below the dam. Various measures will be implemented to ensure that: trapped animals are held, transported, and/or killed humanely; Steller sea lions are not accidentally killed; and public safety is maintained.

Non-Lethal Deterrence Activities

Funded by NMFS, the Corps, and the BPA, the States (in partnership with the Corps and Columbia River Inter-Tribal Fish Commission (CRITFC)) propose to continue using non-lethal sea lion deterrence methods including: above water deterrence (vessel chasing, cracker shells, aerial pyrotechnics, rubber projectiles); and underwater deterrence (physical barriers such as sea lion exclusion devices, acoustic deterrent devices, and underwater firecrackers). A detailed description of these techniques was provided in the previous biological opinions and is incorporated herein by reference (F/NWR/2011/05874).

Capture, Marking, and Relocation

Sea lions would be captured at the dam using up to four or more caged floating platforms that would be placed in locations readily accessible to the animals. A detailed description of these techniques was provided in the previous biological opinions and is incorporated herein by reference (F/NWR/2011/05874).

In 2015 there were three accidental mortalities, two California sea lions and one Steller sea lion, at Bonneville Dam associated with trapping operations, which was due to a temporary power failure: the main doors on the traps used at Bonneville Dam are held open by electromagnets powered by a 12-volt lead-acid battery. The States inspected the battery on the trap that had closed prematurely and found that one of the two wires was slightly loose on the battery post as a result from rocking of the trap while animals moved about allowed the wire providing power to the electromagnet to momentarily lose contact with the battery post resulting in the door closing. Since then the States have taken additional steps, described below, to further reduce the likelihood of unintended impacts associated with trapping.

When stored for long periods between dedicated trapping operations, both trap doors are shut and secured. During trapping seasons, when trapping is not expected to occur within about 24 hours, the small rear door is tied closed with line and the front door is secured in the open position with heavy chain and a keyed padlock. In anticipation of trapping

¹ In the States' 2006 application, the PBR was 8,333 animals out of an estimated population of 237,000. In 2007 the population estimate, based on pup counts, was revised to 238,000 with a minimum population size (N_{min}) of 141,842 and the calculated PBR was 8,511. In 2008, NMFS authorized removal of 1% of the PBR which was 85 animals. Carretta et al. 2011 estimated the California sea lion population to be 296,750. The new PBR is was calculated at 9,200. This population estimate has not be revised since 2011 (Carretta et al. 2015). As such, NMFS evaluation of the States' 2016 application request to remove 92 animals per year remains at 1% of PBR evaluated in our 2012 LOA.

animals sometime in the coming 24 hour period, traps equipped with electromagnetic door releases are unlocked, unchained, set, and left open. Beginning in the spring of 2016, traps that use a remote release electromagnetic door closing system may be equipped with a sensing device that detects and reports (via a cell phone text message) if the trap door has closed unintentionally. If such an event occurs then traps will be checked as soon as possible following receipt of closed door message.

Trapping operations may take place any time of the day or night, depending primarily on the behavior of the animals in a particular area and when they choose to use the trap float as a resting area. Night vision equipment is used to observe the trap prior to closing when operations take place at night. To capture the sea lions resting inside the trap, the front vertically sliding door is let down to the trap deck surface. This may be accomplished in several ways, including pulling a tethering line to remove a metal pin supporting the door or rushing the door in a small boat to unlock a chain and let the door down manually. Traps equipped with an electromagnet mounted on a transom over the top of the door holding the door open (up) use a remote triggering device (similar to a garage door opener) to interrupt the electrical circuit which deactivates the magnet allowing the door to fall vertically, closing under its own weight.

1.3 Action Area

“Action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediately area involved in the action (50 CFR 402.02). The proposed action would be implemented at Bonneville Dam. Bonneville Dam is located on the Columbia River at river mile 146, approximately 42 highway miles east of Portland, Oregon. The Oregon-Washington state boundary lies along the main Columbia River channel, dividing the project area between the two states. The Bonneville Lock and Dam facility includes two navigation locks, two powerhouses, a spillway, fish passage facilities, a fish hatchery, and two visitor complexes administered by the Corps.

The action area is the Columbia River from approximately river mile 140 – 147. The proposed action would occur in the section of the Columbia River starting at navigation marker 85 (approximately river mile 140) continuing upstream to the immediate vicinity of the Bonneville tailrace, dam and forebay.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Section 7(b)(3) requires that at the conclusion of consultation, NMFS provides an opinion stating how the agency’s actions would affect listed species and their critical habitat. If incidental take is expected, section 7(b)(4) requires NMFS to provide an incidental take statement (ITS)

that specifies the impact of any incidental taking and includes reasonable and prudent measures to minimize such impacts.

2.1 Analytical Approach

This supplemental biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of “to jeopardize the continued existence of a listed species,” which is “to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species” (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

The critical habitat analysis considers the impacts of the Federal action on the conservation value of designated critical habitat. This biological opinion uses the following definition of destruction or adverse modification (81 FR 7214):

"Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features."

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat likely to be adversely affected by the proposed action
- Describe the environmental baseline in the action area
- Analyze the effects of the proposed action on both species and their habitat using an “exposure-response-risk” approach
- Describe any cumulative effects in the action area
- Integrate and synthesize the above factors to assess the risk that the proposed action poses to species and critical habitat
- Reach jeopardy and adverse modification conclusions
- If necessary, define a reasonable and prudent alternative to the proposed action

2.2 Rangewide Status of the Species and Critical Habitat

This supplemental opinion examines the status of each species that would be affected by the proposed action. The status is the level of risk that the listed species face, based on parameters considered in documents such as listing decisions, recovery plans, and status reviews. The species status section helps to inform the description of the species’ current “reproduction, numbers, or distribution” as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that

make up the designated areas, and discusses the current function of the essential physical and biological features that help to form that conservation value.

One factor affecting the status of ESA-listed species considered in this supplemental opinion, and aquatic habitat at large, is climate change. Climate change is likely to play an increasingly important role in determining the abundance and distribution of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. Areas with elevations high enough to maintain temperatures well below freezing for most of the winter and early-spring will be less affected. Low-elevation areas are likely to be more affected.

During the last century, average regional air temperatures increased by 1.5°F, and increased up to 4°F in some areas. Warming is likely to continue during the next century as average temperatures increase another 3 to 10°F. Overall, about one-third of the current cold-water fish habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (USGCRP 2009).

Precipitation trends during the next century are less certain than for temperature but more precipitation is likely to occur during October through March and less during summer months, and more of the winter precipitation is likely to fall as rain rather than snow (ISAB 2007; USGCRP 2009). Where snow occurs, a warmer climate will cause earlier runoff so stream flows in late spring, summer, and fall will be lower and water temperatures will be warmer (ISAB 2007; USGCRP 2009).

Higher winter stream flows increase the risk that winter floods in sensitive watersheds will damage spawning redds and wash away incubating eggs. Earlier peak stream flows will also flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and the risk of predation. Lower stream flows and warmer water temperatures during summer will degrade summer rearing conditions, in part by increasing the prevalence and virulence of fish diseases and parasites (USGCRP 2009). Other adverse effects are likely to include altered migration patterns, accelerated embryo development, premature emergence of fry, variation in quality and quantity of tributary rearing habitat, and increased competition and predation risk from warm-water, non-native species (ISAB 2007).

The earth's oceans are also warming, with considerable interannual and inter-decadal variability superimposed on the longer-term trend (Bindoff *et al.* 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (Scheuerell and Williams 2005; Zabel *et al.* 2006; USGCRP 2009). Ocean conditions adverse to salmon and steelhead may be more likely under a warm climate regime (Zabel *et al.* 2006). Additionally, changes in the carbon cycle can change the pH of the water as increasing levels of carbon are absorbed by the oceans. Marine fish species have exhibited negative responses to ocean acidification conditions that include changes in growth, survivorship, and behavior. Marine phytoplankton, which are the base

of the food web for many oceanic species, have shown varied responses to ocean acidification that include changes in growth rate and calcification (Feely *et al.* 2012).

2.2.1 Status of the Species

ESA-Listed Species in Columbia River Basin

In the Columbia River basin there are currently 13 ESUs/DPSs of salmon and steelhead listed as threatened or endangered under the ESA. Of these 13 listed species, nine have a geographic range that overlaps with the action area and have juvenile or adult run-timing that coincides with the period when pinnipeds are present below Bonneville Dam from January through May and would therefore be present when the California sea lion removal program takes place.

The 9 ESUs/DPSs salmonids whose spatial and temporal distributions coincide with the presence of pinnipeds in the action area are the: (1) Upper Columbia River spring-run Chinook salmon ESU; (2) Snake River spring/summer-run Chinook salmon ESU; (3) the juvenile outmigration of Snake River sockeye salmon ESU; (4) Upper Columbia River steelhead DPS; (5) Snake River Basin steelhead DPS; (6) Middle Columbia River steelhead DPS; (7) Lower Columbia River steelhead DPS; (8) Columbia River chum salmon ESU; and (9) Lower Columbia River (LCR) coho salmon ESU. Additionally, the spatial and temporal distributions of green sturgeon and eulachon coincide with the presence of pinnipeds in the action area.

The extinction risk and ESA listing classifications for these ESUs/DPSs remains substantially unchanged or slightly improved from that described in 2012. On August 11, 2015, NMFS reaffirmed the ESA listing classification of green sturgeon as a threatened species under the ESA (NMFS 2015). On April 1, 2016, NMFS reaffirmed the ESA listing classification of eulachon as a threatened species under the ESA (NMFS 2016). On May 26, 2016, NMFS reaffirmed the ESA listing classifications of the salmon and steelhead considered in this opinion as threatened or endangered species under the ESA (NMFS 2016a). Therefore, the species descriptions, listing history, viability ratings and current status reported in the 2012 biological opinion are incorporated by reference (F/NWR/2011/05874).

Salmonid Critical Habitat

Critical habitat has been designated for each of the 9 listed salmonids affected by the proposed action². The dates of designation and a general description of the area designated for these designations were provided in the 2012 opinion and are incorporated by reference (F/NWR/2011/05874).

² On February 24, 2016, NMFS issued a final rule designating critical habitat for LCR coho salmon (81 FR 9251). Critical habitat for LCR coho salmon within the action area is completely overlapped by that for the other 12 salmonid stocks, as presented in the 2012 biological opinion, and are incorporated by reference (F/NWR/2011/05874).

2.3 Environmental Baseline

The “environmental baseline” includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

2.2.1 Listed Species Considered in this Opinion

The environmental baseline for listed species in the action area, including elements of critical habitat in freshwater migration corridors, is functionally the same from the conditions described in the 2009 and 2012 biological opinions and is incorporated by reference. While the level of non-lethal deterrence effort may have varied since the previous analysis (Table 1), the impacts are similar to those previously identified.

Table 1. Annual summary of boat-based hazing activities at Bonneville Dam.

Year	Days	Events	Munitions	
			Cracker Shells	Sea Bombs
2009	30	277	6667	1154
2010	23	196	3431	697
2011	38	257	7839	2439
2012	31	288	1183	401
2013	34	299	740	392
2014	35	252	711	440
2015	31	361	1254	735

Source: Hatch et al. 2016

2.4 Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

Effects on Species

Effects on Salmonids

The potential direct and indirect effects on listed salmonids from the pinniped deterrence program at Bonneville Dam remain unchanged from the 2009 and 2012 opinions (F/NWR/2011/05874) because activities at the dam will be the same as those previously assessed. The effects of surface activities directed at sea lions, vessel hazing, aerial pyrotechnics, and cracker shells present no new or unknown risks compared to those

previously considered. Safety protocols for the use of underwater firecrackers that were implemented to protect fish will remain in place.

Beneficial Effects – Removal of predatory California sea lions at Bonneville Dam is expected to benefit the affected species considered in the opinion by decreasing predation events at Bonneville Dam, improving passage conditions (opportunity), and increasing the number (abundance) of adult salmon and steelhead that reach their respective up-river spawning areas. In their January 27, 2016, application, the States estimated that the removal program has prevented the loss of 15,000 to 20,000 salmonids at Bonneville Dam since the program began in 2008. NMFS expects a comparable range of benefits from implementation of the pinniped removal program through 2021.

Adverse Effects – The estimated abundances of returning adults and juvenile salmonids migrating through the action area are expected to fall within the range provided in Table 2.

Table 2. Estimates of Salmonids Caught by California and Steller sea lions based on Surface Observations 2002 through 2015

Year			ALL PINNIPEDS		CALIFORNIA SEA LIONS		STELLER SEA LIONS	
	TOTAL	TOTAL	ESTIMATED	%	ESTIMATED	%	ESTIMATED	%
	HOURS	SALMONID	SALMONID	RUN	SALMONID	RUN	SALMONID	RUN
	OBSERVED	PASSAGE	CATCH	TAKEN	CATCH	TAKEN	CATCH	TAKEN
2002	662	284,732	1,010	0.35%	1,010	0.35%	0	0.00%
2003	1,356	217,934	2,329	1.06%	2,329	1.06%	0	0.00%
2004	516	186,771	3,533	1.86%	3,516	1.85%	7	0.00%
2005	1,109	81,252	2,920	3.47%	2,904	3.45%	16	0.02%
2006	3,650	105,063	3,023	2.80%	2,944	2.72%	76	0.07%
2007	4,433	88,474	3,859	4.18%	3,846	4.17%	13	0.01%
2008	5,131	147,558	4,466	2.94%	4,292	2.82%	174	0.11%
2009	3,455	186,056	4,489	2.36%	4,037	2.12%	452	0.24%
2010	3,609	267,167	6,081	2.23%	5,095	1.86%	986	0.36%
2011	3,315	223,380	3,557	1.57%	2,527	1.11%	1,030	0.45%
2012	3,404	171,665	2,107	1.21%	998	0.57%	1,109	0.64%
2013	3,247	120,619	2,714	2.20%	1,402	1.14%	1,312	1.06%
2014	2,947	219,929	4,313	1.92%	2,615	1.17%	1,699	0.76%
2015	2,995	239,326	9,981	4.00%	7,779	3.12%	2,202	0.88%

Source U.S. Army Corps of Engineers, 2016.

Given the numbers of listed fish likely to be present during the action, the small likelihood of actually encountering them, and the even smaller chance that they will suffer any adverse effects from any such encounters, NMFS determined that the non-lethal deterrence and removal actions are not likely to cause adverse effects greater than those previously described and accounted for in the 2009 and 2012 opinions. Given that there have been no observed salmonid injuries or mortalities following the

implementation of protective safety measures for underwater firecrackers³, the previous take estimate has not been exceeded and appears conservative and adequate for the proposed action through 2021.

Effects on Critical Habitat

Critical Habitat

The field activities to be conducted under the proposed authorization are the same as those previously analyzed in the 2009 and 2012 opinions (incorporated by reference) and no new effects on critical habitat are anticipated (F/NWR/2011/05874).

2.5 Cumulative Effects

“Cumulative effects” are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Because the action area is located in close proximity to Bonneville Dam and entirely within the Columbia River Gorge National Scenic Area, we anticipate that *all* future activities that could in any way alter habitat or affect listed species will undergo Federal consultation. Therefore, there are not likely to be any cumulative effects—as the ESA defines them—that would impact listed species in the action area.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step of NMFS’ assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action to the environmental baseline and the cumulative effects to formulate the agency’s biological opinion as to whether the proposed action is likely to: (1) result in appreciable reductions in the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat.

The status of the species affected by the proposed action varies. As noted in our 5-year reviews, some species, such as the UCR spring-run Chinook salmon remain at high risk, while other species, such as the MCR steelhead are at lower risk but may still become endangered in the foreseeable future. Increased pinniped predation has been identified as a threat to all of the salmon and steelhead species addressed by this consultation. The proposed action will reduce pinniped predation and should improve the abundance and

³ E-mail from Bjorn Van der Leeuw, Corps, to Robert Anderson, NMFS, dated February 23, 2016, regarding no observations of injuries or mortality to salmonids from hazing or non-lethal deterrence measures for the 2012-2015 field season

productivity of the salmon and steelhead species affected by the proposed action. A very small number of salmon or steelhead may be injured or killed by the proposed action. When considered in the context of total ESU and DPS abundance, the number of fish that may be injured or killed by the proposed action at irregular and unpredictable intervals is far too small to cause any measurable effect of population abundance or productivity given the uncertainty in estimating extinction risk. Additionally, these effects are spread over all of the ESUs and DPSs and no one species is likely to be disproportionately affected. For these reasons, neither the survival nor the recovery of any salmonid species is likely to be appreciably reduced. Given, the anticipated reduction in pinniped predation, salmonid species likely will benefit from this action.

As noted in our previous opinions, critical habitat for salmon and steelhead in the Columbia River basin has been degraded by a number of human activities including hydropower development, urban development, agriculture, timber harvest, mining, and road construction. Although the proposed action will occur within an area designated as critical habitat for a number of salmon and steelhead species, no long-term effects on critical habitat will occur. Critical habitat within the action area is primarily used as a migration corridor for salmon and steelhead. The elements of free passage and water quality may be temporarily impacted by the use of explosives, but this effect will be temporary and of short duration. Climate is not expected to amplify these effects. The proposed action will have no measureable effect on the ability of this critical habitat to serve its intended conservation role (providing an adequate freshwater migration corridor to and from spawning areas).

As described above, this program may result in short term disturbance or displacement from the area immediately below Bonneville Dam but is not expected to have any lasting adverse effect ESA-listed species considered in this opinion. The anticipated effects, primarily, short term disturbance fish in the area downstream from Bonneville Dam, will have no measurable impact on the reproduction, numbers, or distribution of the species considered in this opinion and therefore will not appreciably reduce the survival or the recovery of the species.

2.7 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of UCR spring Chinook salmon, SR sockeye salmon, SR spring/summer-run Chinook salmon, LCR coho salmon, LCR chum salmon, UCR steelhead, SRB steelhead, MCR steelhead, and LCR steelhead or to destroy or adversely modify their designated critical habitats.

2.8 Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption.

Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by regulation to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For purposes of this consultation, we interpret “harass” to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.⁴ Section 7(b)(4) and Section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA, if that action is performed in compliance with the terms and conditions of this incidental take statement.

2.8.1 Amount or Extent of Take

The proposed actions will take place in the Columbia River in the vicinity of Bonneville Dam during times when they will likely have an adverse effect on juvenile and adult UCR spring-run Chinook salmon, SR sockeye salmon, SR spring/summer-run Chinook salmon, LCR coho salmon, CR chum salmon, UCR steelhead, SRB steelhead, MCR steelhead, and LCR steelhead. Salmonid habitat in this area will not be affected to any measurable degree.

As stated in the 2012 opinion, the Corps confirmed that they have no evidence from field observations to suggest any fish were injured or killed due to any hazing/non-lethal deterrents. These findings were confirmed again by the Corps for the 2012 to 2015 field seasons.⁵

Incidental take caused by the action cannot be accurately quantified as a number of fish to be taken, because the number of fish at a given location at a given time are affected by myriad abiotic and biotic factors such as habitat quality and availability, competition, and predation, as well as interactions among these factors. These factors interact in ways that may be random or directional, and may operate across broader temporal and spatial scales that are affected by the proposed action. Thus, the distribution and abundance of fish within the action area cannot be attributed entirely to the action, nor can we precisely predict the number of fish that are reasonably certain to be injured or killed related to the proposed action. Also, there is no feasible way to count, observe, or determine the

⁴ NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as “to trouble, torment, or confuse by continual persistent attacks, questions, etc.” The U.S. Fish and Wildlife Service defines “harass” in its regulations as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). The interpretation we adopt in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the U.S. Fish and Wildlife interpretation of the term.

⁵ E-mail from Bjorn Van der Leeuw, Corps, to Robert Anderson, NMFS, dated February 23, 2016, regarding no observations of injuries or mortality to salmonids from hazing or non-lethal deterrence measures for the 2012-2015 field season.

number of fish that would be injured or killed by the proposed action to the affected species addressed in this opinion. This is because (1) the effects of the action would take place in the vicinity of Bonneville Dam where in-river conditions are highly turbulent due to spring runoff and dam operations, and most injuries or deaths are likely to occur in areas where fish cannot be observed (*e.g.*, deep water or remote areas downriver); (2) even if injured or dead fish were observed, it would be difficult or impossible in many cases to determine an exact cause of injury or death, or could manifest later in time at locations where they could not readily be observed.

Therefore, since a direct estimate of the number of fish that maybe injured or killed due to hazing activities cannot be estimated, we will use the maximum number of instances in which munitions, cracker shells and sea bombs have been used in any given year over the past 5 years for non-lethal hazing at Bonneville Dam as a surrogate for the amount of incidental take, and as a threshold for reinitiation of consultation. Based on the 2011 through 2015 data for the use of munitions used at Bonneville Dam, the threshold for reinitiation of consultation from non-lethal hazing activities in a single year is 7,839 (cracker shells) and 2,439 (sea bombs).

As stated above, the actions are not likely to have any measurable effect on habitat; therefore we do not anticipate there will be any take associated from harm caused by habitat alterations.

2.8.2 Reasonable and Prudent Measures

“Reasonable and prudent measures” are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02). “Terms and conditions” implement the reasonable and prudent measures (50 CFR 402.14). These must be carried out for the exemption in section 7(o)(2) to apply.

Reasonable and Prudent Measures

The action agencies shall ensure that:

1. The Corps’ safety protocols for using deterrence devices are followed.
2. Non-lethal deterrence measures are carried out in accordance with the devices’ manufacturers’ instructions.
3. NMFS receives a yearly monitoring report on the non-lethal deterrence, capture, and removal activities.

2.8.3 Terms and Conditions

1. To implement reasonable and prudent measure #1, the action agencies shall ensure that:

- Boats keep a 100-foot minimum approach distance from all project structures.
- Boats keep a 150-foot minimum approach distance from fishway entrances.

- No firecrackers are used within 300 feet of any fishway, floating orifice, Bonneville Powerhouse 2 Corner Collector, smolt monitoring facility outfall, or within 150 feet of any shoreline or shallow area.
 - Firecracker use is limited to no more than five per animal per encounter within the boat restricted zone.
 - No firecracker is used within the boat-restricted zone once fish counts reach 1,000 fish per day.
 - Seal bombs are deployed according to manufacturer’s instructions and in compliance with Corps’ safety protocols.
2. To implement reasonable and prudent measure #2, the action agencies shall ensure that:
- All operators read, understand, and follow the manufacturers’ instructions for all non-lethal deterrence devices.
3. To implement reasonable and prudent measure #3, the action agencies shall ensure that:
- A full report is sent to NMFS by December 30th every year.
 - The report fully describes the year’s non-lethal deterrence and removal activities—particularly noting the number of listed salmonids taken and the location, the type of take, the numbers, the take dates.
 - The report gives a brief description of the project’s results with regard to removing and non-lethal deterring California sea lions—including an estimate of how many salmonids were saved from predation.
 - The reports are sent to:

Robert Anderson
 Protected Resources Division
 National Marine Fisheries Service
 1201 N.E. Lloyd Boulevard, Suite 1100
 Portland, Oregon 97232

2.9 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). No conservation measures have been identified at this time for the actions evaluated in this opinion.

2.10 Reinitiation of Consultation

As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or

is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.11 “Not Likely to Adversely Affect” Determinations

As noted above, field activities to be conducted under the proposed authorization are the same as those previously analyzed in the 2012 opinion (incorporated by reference) and no new effects on green sturgeon or eulachon, or their designated critical habitats, are anticipated. Therefore, we have determined that the proposed action is not likely to adversely affect the southern DPS of eulachon, its designated critical habitat, or the southern DPS of green sturgeon.

3. MAGNUSON-STEVENS ACT ESSENTIAL FISH HABITAT CONSULTATION

“Essential fish habitat” (EFH) is defined in section 3 of the Magnuson-Stevens Act (MSA) as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” NMFS interprets EFH to include aquatic areas and their associated physical, chemical, and biological properties used by fish that are necessary to support a sustainable fishery and the contribution of the managed species to a healthy ecosystem. EFH has been designated for Pacific salmon, groundfish, and coastal pelagic species. For information on EFH for these species, please see this website: <http://www.nwr.noaa.gov/Salmon-Habitat/Salmon-EFH/Index.cfm>.

The MSA and its implementing regulations at 50 CFR 600.920 require a Federal agency to consult with NMFS before it authorizes, funds, or carries out any action that may adversely affect EFH—in this case, EFH for Pacific salmon, groundfish, and coastal pelagic species. The purpose of consultation is to develop a conservation recommendation(s) that addresses all reasonably foreseeable adverse effects on EFH. Further, the action agency must provide a detailed, written response to NMFS within 30 days of receiving an EFH conservation recommendation. The response must include measures proposed by the agency to avoid, minimize, mitigate, or offset the impact of the activity on EFH. If the response is inconsistent with NMFS’ conservation recommendation the agency must explain its reasons for not following the recommendation.

However, in this instance, no conservation recommendations are necessary. As the opinion above states, the sea lion removal program at Bonneville Dam is not likely, singly or in combination, to adversely affect the habitat upon which Pacific salmon, groundfish, and coastal pelagic species depend. All the actions are of limited duration, minimally intrusive, and are entirely discountable in terms of their effects, short-or longterm, on any habitat parameter important to the fish. Therefore, we reaffirm here in this opinion, based on a review of the best available scientific information, that the

proposed action will not adversely affect EFH for Pacific salmon, groundfish, and coastal pelagic species. The action agencies must reinitiate EFH consultation if plans for these actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the EFH conservation recommendations (50 CFR Section 600.920(k)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are [National Marine Fisheries Service, U.S. Army Corps of Engineers, and Bonneville Power Administration]. Individual copies of this opinion were provided to the [Idaho Department of Fish and Game, Washington Department of Fish and Wildlife, and Oregon Department of Fish and Wildlife]. This opinion will be posted on the Public Consultation Tracking System web site (<https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts>). The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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