

**FIELD REPORT:  
2008 PINNIPED MANAGEMENT ACTIVITIES AT BONNEVILLE DAM**

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**INTRODUCTION**

This year (2008) marked the fourth consecutive year of research and management of pinnipeds at Bonneville Dam led by the Oregon Department of Fish and Wildlife (ODFW) and Washington Department of Fish and Wildlife (WDFW). This work has been conducted in close coordination and cooperation with the US Army Corps of Engineers (USACE), the Columbia River Inter-Tribal Fish Commission (CRITFC), and the National Marine Fisheries Service (NMFS). Other cooperating agencies and organizations included: Bonneville Power Administration (BPA), Northwest Power and Conservation Council (NWPCC), Pacific States Marine Fisheries Commission (PSMFC), US Department of Agriculture Wildlife Services (USDA), US Coast Guard (USCG), Point Defiance Zoo & Aquarium (PDZA), Portland State University (PSU), and state and local law enforcement. Background on this work and links to supporting documents can be found at <http://www.nwr.noaa.gov/Marine-Mammals/Seals-and-Sea-Lions/States-MMPA-Request.cfm> and <http://www.nwd-wc.usace.army.mil/tmt/documents/fish/>.

Pinniped management activities led by ODFW and WDFW at Bonneville Dam are authorized under the Endangered Species Act (ESA), and Sections 109h and 120 of the Marine Mammal Protection Act (MMPA). This report is intended to fulfill regulatory and contractual reporting requirements; it is not intended to be a comprehensive report on all pinniped-related activities at the dam during 2008.

**METHODS**

Boat-based deterrent activities

Boat-based pinniped hazing was conducted below Bonneville Dam from December 2007 to May 2008. Under MMPA Section 109 and ESA authorities to deal with nuisance sea lions in the Columbia River, boat-based hazers used a combination of acoustic and tactile deterrents (seal bombs, cracker shells, rubber buckshot, and vessel chase) in an attempt to deter pinnipeds from consuming threatened and endangered Columbia River salmon and steelhead (*Onchorynchus* spp.) as well as white sturgeon (*Acipenser transmontanus*). Hazers primarily patrolled the Boat Restricted Zone (BRZ) at the dam in search of sea lions but also traveled downriver. The following was recorded for each discrete hazing event: species and number of pinniped encountered; starting location, time, and direction of travel of the pinniped(s); type and number

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<sup>1</sup> Oregon Department of Fish and Wildlife (ODFW)

<sup>2</sup> Washington Department of Fish and Wildlife (WDFW)

<sup>3</sup> Columbia River Inter-Tribal Fish Commission (CRITFC)

of deterrent devices used; and ending location, time, and direction of travel of the pinniped(s) (see Appendix 1 for example of hazing datasheet). Predation observations and identifying marks of pinnipeds were also noted.

For human and fish safety, boat access within the BRZ was limited to approximately 30 m from all project structures and 50 m from main fishway entrances. No seal bombs were used within 100 m of fishways, floating orifices, Powerhouse 2 (PH2) Corner Collector flume or smolt monitoring facility outfall. In addition, no seal bombs were used once salmon passage exceeded 1000 fish per day. Hazing activities were coordinated daily with USACE Control Room and Fisheries personnel, as well as with USDA Wildlife Services staff who were conducting sea lion hazing activities from project ground facilities. VHF-radio contact was maintained with Control Room staff while boat hazing crews were active in the BRZ.

### Trapping and marking

Floating sea lion traps were deployed in the PH2 tailrace along the corner collector. The trap used during the previous field season was installed on February 20 and three newly constructed traps were deployed on April 21 and 22. The new traps had 6.1 m<sup>2</sup> platforms with 5.5 m<sup>2</sup> chain link cages that were 2.1 m high. Sea lions entered and exited traps via a vertically sliding door that was kept open to allow trap to be used as a haul-out. Trap doors were closed by manually pulling a rope from shore that removed a pin holding the trap door open. Traps were anchored to the bottom and monitored for use by sea lions.

Once sea lions were captured they were herded into holding cages on a barge built specifically to work on adult and sub adult California sea lions. Depending on the species and status of the animal under the state's MMPA Section 120 authority, they were either released on-site (Steller sea lions), branded and released on-site (unmarked California sea lions), or transferred off-site to the PDZA. A crane operated by the Bonneville rigging crew was used to lift and transfer caged sea lions to be transported to PDZA. Once at PDZA, animals were given a health screening by field staff and veterinarians (including members of the States' Institutional Animal Care and Use Committee (IACUC)). Following exams, individual sea lions were either prepared for transfer to permanent captivity or transported back to the Columbia River and released.

### Food habits

Fecal (scat) samples from haul-outs within the project area were collected on an opportunistic basis. Potential collection sites included the Corner Collector apron, floating traps, regional docks and marinas, and Phoca Rock (approximately 12 miles below the dam near Cape Horn). Gastrointestinal tracts from deceased animals were also collected. Individual samples were bagged, labeled and frozen. Undigested remains were recovered and identified to lowest possible taxa. Salmonid bones may be subjected to genetic analysis for stock or run-level identification. (Researchers from Portland State University also collected scat samples from the corner-collector; hard parts recovered from these samples will be provided to ODFW for identification.)

## RESULTS

### Boat-based deterrent activities

Crews from ODFW, WDFW, and/or CRITFC hazed sea lions from boats over 89 days from 12/11/07-5/15/08 (Table 1). A total of 749 hazing events were recorded during which 830 and 523 “takes”<sup>4</sup> of California sea lions (CSL) and Steller sea lions (SSL) occurred, respectively. A total of 9225 cracker shells, 3148 seal bombs, and 590 rubber buckshot rounds were used during deterrent activities. Approximately one-fifth of all hazing events involved an observation of a salmonid being killed (178 fish total). Salmonid predation was documented both inside and outside the tailraces, as far downriver as Skamania Island (approximately 9 miles below the dam).

### Trapping and marking

Under the State’s MMPA Section 120 authorization, sea lion capture events occurred on April 24 and April 28, 2008; a third unplanned event occurred on May 4 (Table 2). During the latter event the doors on two of the four traps were found closed for unknown reasons with animals inside which subsequently died. A total of 15 California sea lions were captured: six were transferred into permanent captivity at Sea World; four were branded and released; one died while under anesthesia at PDZA; and four died on the traps under unknown circumstances on May 4. A total of 4 Steller sea lions were captured: two were released on site and two died on the traps under unknown circumstances during the May 4 event. In addition to branding activities at Bonneville Dam, capture and marking of California sea lions continued at the mouth of the river at Astoria, Oregon.

### Food habits

Identification of undigested remains recovered from sea lion fecal material and gastro-intestinal tracts is currently on-going. Remains identified as salmonids will be submitted for genetic identification at a later date.

## DISCUSSION

Hazing activities in 2008 were conducted primarily to fulfill the requirements of the MMPA Section 120 authorization granted to the States for permanent removal (including lethal) of California sea lions at Bonneville Dam. One component of this Section 120 authorization requires sea lions to have been exposed to non-lethal hazing prior to taking permanent removal actions for each individual animal. In general, the response to hazing in 2008 was similar to that seen in previous years, namely: (1) sea lions learned to avoid the hazing boats; (2) there was no apparent decline in sea lion numbers in response to hazing; (3) loss of salmonids to pinniped predation was not reduced by the hazing efforts; and (4) no negative reaction, injury or mortality to salmonids was observed as a result of the pinniped hazing activities.

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<sup>4</sup> Defined under the Marine Mammal Protection Act as "harass, [emphasis added] hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect."

Our field staff hazing from boats recorded roughly the same number of pinniped-salmonid predation events in areas below the powerhouse tailraces as they did in areas monitored by USACE staff. While it is not possible to make inferences about total predation outside the tailrace area, this observation clearly demonstrates that the number of salmonids lost to pinnipeds as reported by USACE observers on the dam face is a minimum estimate of the number of salmonids taken by pinnipeds in the Bonneville Dam area.

Trapping operations in 2008 began late in the season due primarily to delays in acquisition of funds and equipment required to conduct capture operations on a larger scale. Once we initiated capture operations, availability of experienced capture crews and crane operations were probably the two most important factors limiting more frequent sea lion capture and removal efforts. In addition, lack of use of the traps as haul-out substrate reduced trapping opportunities. Reducing or eliminating haul-out space along the apron of the Corner Collector wall could potentially increase use of the traps for resting areas by sea lions. Such action, however, would require funding, design, and review of possible impacts to fish, plus a significant increase in support for these efforts on the part of ACOE Bonneville Project staff.

In reviewing our activities to remove sea lions under the State's Section 120 authorization, the IACUC concluded that, with the exception of the unintentional and unexplained trapping event of May 4, all other capture, handling and transporting of sea lions was conducted in a safe and effective manner consistent with the norms of handling large, wild animals. Modifications to trapping protocols to avoid a repeat of the May 4 incident have been developed and submitted to NMFS for use in the 2009 field season.

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Table 1. Weekly summary of boat-based hazing activities at and below Bonneville Dam, 12/07-5/08.

Wk #	Wk of	Effort (days/wk) <sup>1</sup>				Boat-days	Take <sup>2</sup>		Munitions used			Salmonid kills <sup>3</sup>	
		OR	WA	IT	Total		CSL	SSL	Cracker shells	Seal bombs	Rubber buckshot	Inside tailraces	Outside tailraces
1	12/09/07	1	2	-	3	3	0	7	73	32	0	0	0
2	12/16/07	3	2	-	4	5	2	45	290	138	35	0	0
3	12/23/07	2	2	-	4	4	1	24	142	52	3	0	0
4	12/30/07	1	2	-	3	3	0	24	404	112	39	0	0
5	01/06/08	3	2	-	5	5	2	57	426	153	51	1	0
6	01/13/08	2	2	-	4	4	3	47	446	143	60	0	0
7	01/20/08	0	0	-	0	0	0	0	0	0	0	0	0
8	01/27/08	2	1	-	3	3	2	22	239	56	12	0	0
9	02/03/08	2	3	-	4	5	2	27	315	114	13	0	0
10	02/10/08	2	5	-	5	7	0	44	258	176	19	0	0
11	02/17/08	2	3	-	4	5	4	42	262	143	10	0	1
12	02/24/08	2	5	-	5	7	19	58	375	226	138	1	1
13	03/02/08	-	4	-	4	4	28	23	383	95	22	3	3
14	03/09/08	-	5	-	5	5	67	5	425	58	56	7	8
15	03/16/08	-	5	-	5	5	52	9	470	221	7	6	4
16	03/23/08	-	3	-	3	3	23	0	193	85	4	5	1
17	03/30/08	-	5	3	5	8	123	12	963	397	26	19	18
18	04/06/08	-	4	5	7	9	151	32	996	344	41	17	15
19	04/13/08	-	2	3	4	5	88	15	474	108	0	10	8
20	04/20/08	-	1	5	6	6	120	18	834	208	9	15	12
21	04/27/08	-	2	2	2	4	74	4	697	209	22	8	11
22	05/04/08	-	0	0	0	0	0	0	0	0	0	0	0
23	05/11/08	-	3	4	4	7	69	8	560	78	23	3	1
Total		22	63	22	89	107	830	523	9225	3148	590	95	83

<sup>1</sup> OR=ODFW, WA=WDFW, IT=CRITFC; more than one boat may have operated per day (see boat-day column).

<sup>2</sup> Take refers to numbers of animal-harassment events; CSL=California sea lion, SSL=Steller sea lion.

<sup>3</sup> Salmonid kills observed during boat-based hazing inside and outside dam tailraces; observations were anecdotal and should not be used to infer predation rates outside the tailraces.

Table 2. Summary of sea lion capture activities at Bonneville Dam, 2008.

Capture date	Species	Brand	Alt ID	Weight (lbs)	Eligible for removal?	Disposition	
						Initial	Final
4/24/08	SSL					Released, Bonneville Dam	
	SSL					Released, Bonneville Dam	
	CSL	C319		1269	YES	Transferred to Pt. Defiance Zoo, WA	Captivity, Sea World, TX
	CSL	C606		600	YES	Transferred to Pt. Defiance Zoo, WA	Captivity, Sea World, TX
	CSL	C739	B136	783	YES	Transferred to Pt. Defiance Zoo, WA	Captivity, Sea World, TX
	CSL	C795 <sup>1</sup>		1203		Transferred to Pt. Defiance Zoo, WA	Released, Astoria, OR
	CSL	C796 <sup>1</sup>		1060		Transferred to Pt. Defiance Zoo, WA	Released, Astoria, OR
	CSL	C797 <sup>1</sup>		959		Transferred to Pt. Defiance Zoo, WA	Released, Astoria, OR
4/28/08	CSL	C805 <sup>1</sup>	B208		YES <sup>2</sup>	Released, Bonneville Dam	
	CSL		B198	1454	YES	Transferred to Pt. Defiance Zoo, WA	Dead, Pt. Defiance Zoo, WA <sup>4</sup>
	CSL		B66	992	YES	Transferred to Pt. Defiance Zoo, WA	Captivity, Sea World, FL
	CSL	C640		935	YES	Transferred to Pt. Defiance Zoo, WA	Captivity, Sea World, FL
	CSL	C668		980	YES	Transferred to Pt. Defiance Zoo, WA	Captivity, Sea World, FL
5/4/08	SSL					Dead, Bonneville Dam <sup>3</sup>	
	SSL					Dead, Bonneville Dam <sup>3</sup>	
	CSL	C347			YES	Dead, Bonneville Dam <sup>3</sup>	
	CSL	C672				Dead, Bonneville Dam <sup>3</sup>	
	CSL		B252		YES	Dead, Bonneville Dam <sup>3</sup>	
	CSL		B275			Dead, Bonneville Dam <sup>3</sup>	

<sup>1</sup> Branded subsequent to capture.

<sup>2</sup> Alternate ID (and eligibility for removal) only confirmed after having been branded and released.

<sup>3</sup> Deaths under investigation.

<sup>4</sup> Died under anesthesia.

Appendix 1. Example of data form used during 2008 boat-based hazing activities.

**BONNEVILLE PINNIPED HAZING PROJECT**

DATE(MM/DD/YY) 04/22/08 AGENCY/CREW CRITFC DRH, JP, KS, DL

VISIBILITY (G/F/P) P TIME START 0827 TIME END 1425

COMMENTS (e.g., haul-out count, angling pressure): \_\_\_\_\_

Enter one record per animal or group hazed\*:

START			SPC. #		METHOD(S) #				END			Fish kill (sp.)	Brand
TIME (24 hr)	AREA (map)	DIR (U/D/S/?)	Z	F	CS	SB	SR	RB	TIME (24 hr)	AREA (map)	DIR (U/D/S/?)		
0830	PA1	?	3		4				0845	PA1	?		
NOTES:													
0845	PA	?	2		5				0900	PA	↓	SA	
NOTES:													
0905	PA1	?	1		4				0910	PA	↓	SA	
NOTES:													
0915	PA2	?	2		4				0930	PA2	?		
NOTES:													
0945	PA1	↑	4		15				1000	HR	↓	SA	
NOTES:													
1005	HR	↑	4		35	15			1035	WR	?		
NOTES:													
1040	WR	↑	3		22	17			1055	ML	↓		
NOTES:													
1115	PA	↑	2		17				1135	HR	↓		
NOTES:													

\*Data codes: Direction: ↑=upriver, ↓=downriver, /=stationary, ?=unknown. Hazing method(s): CS=cracker shells; SB=seal bombs; SR=screamer/banger rockets; RB=rubber buckshot/batons (enter amounts). Fish kill: SA=salmonid; ST=sturgeon; LA=lamprey; O=other (describe in notes). Brand: enter letter and #s (use ? as placeholder for unread, but seen, letter or digit)

Entered by / date: \_\_\_\_\_ Verified by / date: \_\_\_\_\_

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